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## ORIGINAL CONTRIBUTIONS

### THE MECHANICS OF THE COLON*

Wesley E. Gatewood, M.D.
PORTLAND, ORE.

Constipation and a group of symptoms referable to motor dysfunction of the large bowel bring more patients to the gastroenterologist than any other causes. Jordan and Kiefer[1] have recently reported that in a series of 3000 admissions to the Gastrointestinal Service of the Lahey Clinic, 30 per cent were found to have no other lesion of the digestive tract. In my own personal experience both in a large free clinic and in private practice I feel sure that at least half of the patients whom I examine because of abdominal complaints have no trouble except for a disturbance in the handling of the fecal contents of their bowels.

Some physicians have asserted that these disturbances of the colon lead to important pathologic changes in other organs. There has never been any scientific proof for such assumptions, and I really doubt if it can be shown that the motor malfunction of the large bowel materially shortens the life of man. On the other hand, we may be very sure that many of our patients are rendered unfit and unhappy both physically and mentally because of their bowel conditions. Colitis, as the motor disturbance of the large bowel is frequently and improperly called, has come in many circles to be a fad. The correction of constipation and the relief of symptoms from an irritable colon mean usually a return of normal function rather than the cure of a disease.

In a consideration of the function of the colon we cannot isolate it either from the remainder of the tract or from the body as a whole. A review of the evolution of the digestive and nervous systems, beginning with the simpler forms and following up to the more complex, gives us a better understanding of their anatomy and physiology in man. Likewise embryology suggests function and mechanism.

From such studies it seems that the primitive digestive tract was a tube which originally performed without an elaborate nervous system. Later the equivalent of the myenteric or Auerbach's plexus was laid down along this tube. The function of this primitive neurenteric mechanism is chiefly motor, capable of local reflex responses. With the development of a more highly specialized digestive tract came also a more highly organized nervous system. Finally the digestive tract of the vertebrate has become indeed complex.

Retaining its tubular form it has connected with it large glandular structures, such as the liver and pancreas, with special circulatory apparatus and producing various chemical substances for the dissolution of the food as it passes through the tube. The nervous system has become more elaborate and sensory and motor connections have grown in to connect with the simple system originally present in the wall of the gut. In both the simpler and

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* Read before King County Medical Society, Seattle, Wash., Oct. 7, 1929.

more highly developed forms of animal life an underlying segmental pattern can be discerned. The segments of the head end are in general like those of the tail end but more complex, more active and more sensitive.

In the vertebrates the absorptive apparatus of the digestive tract has become so specialized that some of the dissolved food goes into one collecting mechanism and other substances of a different character go another way. The mucous membrane lining the digestive tube is adapted to meet the requirements of its evolution. Its forward portion is largely secretory and absorbs little, its caudal portion is less of a secretory and more of an absorptive apparatus, thus eliminating waste.

In the past thirty years physiologic and antomic studies have yielded important data concerning the neuromechanism of the digestive tube. The work of Alvarez[2] and others has shown that the smooth muscle fibers in the wall of the intestine have within them the property of rhythmic contraction. Alvarez, by patient and careful experimentation and studious investigation of the simpler forms of life, has added much to our conception of gastrointestinal physiology. He has shown that the power, the tone and the rate of the rhythmic contractions of muscle in the digestive tube, as well as the sensitivity and in fact even the metabolism of the motor apparatus, are graded downward from the beginning to the end.

His theory of gradients should now be accepted as a physiologic principle. It is the most important addition to the physiology of the digestive tract in recent years. It does not explain the entire performance of the motor apparatus, but gives us a more complete understanding of the behavior of the muscle.

We must also recognize the elaborate nervous connections, sensory and motor. It is through this nervous control that the activities of the various segments of the tract are correlated and coordinated, one part with another and all parts with the remainder of the body. The local myenteric mechanism is much the same throughout the tract. It provides the phenomenon of peristalsis. Thirty years ago Bayliss and Starling showed that stimulation of the small intestine usually results in contraction above and relaxation below the point at which the stimulant is applied. The phenomenon later was designated by Cannon as the "myenteric reflex." The intestine has a nervous system of its own, through which local coordinated reflexes can be carried out. Later the development connections grew in from the nervous system. Anatomically and functionally the sympathetic system is closely related to the adrenals. Langley has stated that the effect of adrenalin on a tissue is similar to a stimulation of its sympathetic nerves. Perhaps this explains at least in part the diarrhea of hyperthyroidism and of fright and similar emotions.

The parasympathetic or vagosacral system is of a later development. Physiologic and pharmacologic studies indicate that these two portions of the involuntary nervous system are to some extent antagonistic. From the ganglia of each come both motor and inhibitory fibers. If the stimulation of the sympathetic results in contraction as a rule, the stimulation of the corresponding vagosacral nerves causes an inhibition producing relaxation. We are quite familiar with this form of nervous mechanism as manifested in the control of the iris, the size of the pupil being the result of a balance between the oculomotor and sympathetic impulses, and the rate of the heart, the result of a balance between vagal inhibitory and sympathetic acceleratory reactions.

Where there is a predominance of muscle fiber, it would be anticipated that there would also be an increase in nerve tissue, and so at the sphincters there is an increased supply of the nerve fibers, as if to supply these officials with more authority. In short, the entire digestive tube is provided with a muscular coat capable of working automatically and spontaneously and yet functioning under the coordinating control of the involuntary nervous system. At the beginning and at the end of the tract there is a sphincter under the voluntary control of the nervous system.

As we follow food in its passage through the digestive tract, we note a series of rhythmic movements, collecting and massing the food. Each portion of the tube is somewhat different in its appearance, its purpose and the character of its contents.

In general the types of active movements are similar throughout. They consist of segmentation, peristaltic waves, reverse waves and mass movements. The segmentation is apparently due to rather local neuromuscular reflexes, as is also the phenomenon of peristalsis. Such movements as the rapid transport of the material from one segment of the small bowel to a distant portion would seem to be due to either more violent local reactions or a combined action of several portions of the canal, and probably controlled by longer and more complex neuromuscular reflexes. In the small intestine segmentation is a pronounced phenomenon. There are rushes which start above and carry long distances down the bowel, to end either against a pendulum movement, or against a sphincter, or to fade away as they lose in force. Several of these rushes may occur at a time.

Another form of movement, varying in frequency and extent and perhaps of considerable importance, is the passive movement accompanying respiration. I am of the opinion that the changes in intraabdominal pressure and the passive movements of the abdominal contents are of considerable importance in the conveyance of liquids through the tube, as well as an important stimulant of peristaltic activity. Those who have made frequent fluoroscopic examinations of the stomach and bowel certainly have been impressed with the fact that deep breathing will increase peristaltic activity in the inactive stomach and hasten the passage of the barium into the duodenum. They have also observed how much easier and more quickly the colon will fill with a barium enema when the patient breathes slowly and deeply. Possibly some of this effect is due to a temporary change in the muscle tone brought about by stimulation of the vagus.

As shown by a number of observers but particularly by Alvarez in his development of the gradient theory, activity of the small bowel is much greater above and lessened below so that there is considerable accumulation in the distal ileum. The ileocecal sphincter behaves much like the sphincter at the pylorus. It prevents too rapid emptying of the ileum into the colon which would lead to diarrhea, and it prevents the regurgitation of food material from the colon into the ileum.

The bowel from the ampula of Vater to the middle of the transverse colon is derived from the midgut. The right half of the colon is comparable in function to the small bowel, with which it has its common embryologic beginning. It is an organ of digestion and absorption. The content of the ileum as it passes into the cecum is about the consistency of a thin gruel. In it there are still undigested food residues and digestive juices which continue their action. The colon does not supply any important digestive secretions but the processes which were in progress in the ileum are allowed to continue in the proximal colon until they are virtually completed. The chief functions of the colon are absorption, particularly the recovery of water from the fecal mass; and motor, resulting in the ultimate disposal of the indigestibles.

For absorption it is marvelously designed, built like a radiator, having a huge surface for absorption compared with its length and the space which it occupies in the abdomen. A comparison of the length of the colon in different individuals and in different species of animals shows some variation, as if dependent upon the requirement of the individual. In those animals like the dog, in which there is little digestion of cellulose and in which the total digestion has neared completion when the food enters the colon, the colon is relatively short. These animals normally have soft formed stools much like the normal stool of man. In the herbivora, such as the rabbit, sheep and horse, the colon apparently is important in the digestion of cellulose and in these animals the residues are retained somewhat longer in the haustra. Their colons are relatively longer. Their normal stools are much more like the spastic constipation stools of man, consisting of pellets, balls and rounded masses.

The liquid content of the ileum, when a considerable volume of material has collected in the distal portion, is injected somewhat like an enema into the cecum and gradually fills from below upward, until practically the whole of the ascending colon has been moderately distended. This distension then stimulates the neuromotor mechanism of the colon to increased activity. Sampson[3] has shown with the roentgen ray that the cecum normally fills and remains filled from four to twenty-four hours. When peristaltic activity is established in the cecum, it impedes the flow from the ileum. The sensitivity or degree of irritability of the cecum is a factor in determining when active peristalsis in the cecum will begin. Normally the movements here are so sluggish that they are not frequently observed with the roentgen ray.

In a normal individual the cecum usually begins to fill between two and four hours after a meal is taken and becomes moderately distended up to the hepatic flexure by the end of six hours. Considerable has been written concerning ileal and ileocecal stasis. It has frequently been assumed that the position of the ileocecal valve and the mobility of the cecum itself, particularly when it reaches low into the pelvis, are important factors in delaying the progress of the meal. The abdomen is a closed cavity and the bowel and its contents act like fluid elsewhere. The hydrostatic pressure applied to the material in the ileum and proximal colon tends to equalize pressures and level out the grades. After all, peristalsis of these portions of the bowel does not have to actually lift material from the depth of the pelvis to the height of the hepatic flexure, but the same pressure of gravity pushing downward also helps in the lifting of the material after it has entered the colon. The operations directed toward the correction of this supposed defect have failed and in general have been abandoned.

The haustra are a specialized development in the colon. The movements of the haustra are to be considered like the segmentation movements of the small bowel. In the small intestine ring-like contractions occur at short intervals approximately simultaneously so that small segments are formed. These segments in turn are broken up into smaller segments. In this way the forward movement of wave-like peristalsis is somewhat impeded and the liquid content of the small intestine is more intimately mixed with the digestive fluids. In the colon the movements of the haustra are comparable, but these sacculated portions are especially adapted for contracting and holding the contents in place. Therefore, the absorption of water is more effective. Finally, by a more complete contraction of the circular muscles the contents of the haustra are expelled. If they remain for a long period in one place, the drying is so effective that the shape of the haustra is retained when the fecal material is finally expelled from the rectum. Just as we have noted mass movements occurring in the small intestine, the so-called peristaltic rushes, similar movements occur in the large bowel. Here, because the rate of muscular contraction is slower, the contents less fluid and, therefore, more difficult to move, the mass movements are slower. They are not frequently seen except in cases of diarrhea.

On a number of occasions following the introduction of a barium meal into the stomach by careful and prolonged observation I have seen mass movements occur in the colon, particularly in the transverse and descending portions. Reverse peristalsis is a normal phenomenon of the colon, particularly as it occurs in the ascending colon. It forces the contents of the ascending colon backward into the proximal portion and by increasing the pressure stimulates muscular activity in that portion of the colon.

A form of mass movement is probably the regular and normal occurrence in the process of defecation. Some examiners are of the opinion that the descending colon normally remains practically empty and the fecal material gradually collects in the sigmoid and rectum. There are others of the opinion that usually there is a sphincteric action at the lower end of the sigmoid and the sigmoid and descending colon gradually fill, the rectum remaining comparatively empty until shortly before the act of defecation. Personally, I believe that this difference in opinion arises largely because of observations made under different conditions. All of us have made digital examinations of the rectum and found the rectum packed with hard feces, or again filled with soft plastic fecal material and at other times empty. These differences depend upon the behavior of the bowel and the rectum and the time of the examination with relation to previous defecation.

Rankin[4] states, "It has not been definitely proved despite frequent assertions, particularly in discussing such diseases as megacolon, that there is a definite sphincteric mechanism at the rectosigmoid." He refers to the studies of Reeves,[5] in 1917, and more recently those of Martin and Burden[6] which indicate that in about one-half of normal individuals there is some degree of constriction at the point where the sigmoid joins the rectum, but in most instances the change in structure is more gradual. From these anatomic studies and from our clinical observations it seems, therefore, that in the majority of individuals there is no barrier between the descending colon or sigmoid and the rectum. The rate of propulsion has become very slow because of the consistency of the material in the bowel and the motor gradient. Certainly the rate and type of forward movement of the material in the lumen of the bowel is influenced by its consistency as well as by the slower peristaltic movements present in the distal colon.

The arrangement of the longitudinal muscles in the wall of the colon is such that when these muscles contract forcibly, the length of the colon is considerably shortened. I have repeatedly observed this phenomenon with the aid of the fluoroscope. It is particularly marked in the patient with an irritable and spastic colon. During the course of a prolonged examination, the transverse colon, at first seen sweeping low from the hepatic flexure down to the pelvis and again high up to the splenic flexure, may be seen to taughten and by shortening lift from the pelvis to a more horizontal course. In a normal individual the movements of the colon produced by respiration are considerable, and no doubt play an important part in stimulating peristaltic activity and assist in the movement of the more liquid portions of its contents.

Quite recently a very interesting observation has been made by Ivy[7] and his associates on the motility of the rectum in normal and constipated subjects. Thirty-one medical students and twelve patients, the latter said to be constipated and users of carthartics, were the subjects. Through a proctoscope a balloon was inserted into the sigmoid and rectum, then filled with water. Tracings were made according to the pressure exerted by the sigmoid and rectum upon the balloon. The intracolonic pressure varied from 11 to 21 mm. of mercury, averaging from 17 to 20, and there was no appreciable difference in the pressures of the constipated and the normal. The tracings showed usually a distinct tonus rhythm and in the normal individual steep contractions with painful urges to defecate. Welsh and Plant,[8] working at Iowa, reported somewhat similar observations in 1926 and also noted an increase of the muscular activity of the colon after meals. They term this a feeding reflex. Ivy and his coworkers showed that, while steep contractions occurred in the constipated group, they were usually not associated with an urge to defecate and the gastrocolic reflex did not occur in the constipated group.

It seems evident that such pressures in the rectum and sigmoid as recorded by Ivy and by Zimmerman can scarcely be sufficient either to mold the average formed stool nor to force anything other than liquid feces through an intact anal sphincter. Defecation is not so much an activity of the colon as it is the result of coordinated voluntary movements. I wish especially to emphasize this point because it seems to me that only by an appreciation of this physiologic fact can we understand the causes of the average case of constipation. As a matter of fact, the business of the colon in this connection is chiefly to deliver a soft plastic mass into the sigmoid and rectum, where it may be expressed much in the same way as we press out the tooth paste from a tube.

Originating from a common embryologic source, the structure, the nerve supply and the behavior of the rectosigmoid and the urinary bladder are very much alike. When once the anal sphincters have relaxed enough to permit even a small quantity of feces to enter the anal canal, the defecation reflex becomes so strong that the act usually goes on to completion. The process of micturition is similar. By voluntary effort in spite of urge the bladder may be controlled for hours. The muscle tone of the rectosigmoid can adjust itself to an increasing volume of feces and defecation may be postponed for hours or even days.

Judd and Adson,[9] earlier Wade and Royle,[10] have reported the relief of symptoms in patients with megacolon by the destruction of the sympathetic nerve connections supplying the rectum and sigmoid. The underlying principle seems to be the removal of an obstruction due to a failure of circular muscle to relax or, to use the term applied by Hurst, achalasia. By achalasia is meant overactivity of sphincteric muscles due to a lack of proper inhibition, the inhibitory impulses being supplied by the sympathetic nerve fibers.

The consistency of the stool is one of the most important factors in constipation and its management. The passage of a hard and lumpy stool seems to me best likened to the difficulties encountered in a dry labor. Normally the bag of waters serves as an efficient hydrostatic wedge in the dilatation of the uterine cervix. A moldable fecal mass acts in the same way to initiate the relaxation of the internal anal sphincter. When a hard blunt mass is pushed against this sphincter it fails to pass until the sphincter is either sufficiently relaxed or is forcibly stretched to produce a lumen often an inch or more in diameter. The force required to evacuate the normal stool is somewhere between that needed to expel a solid mass and the low pressure of 20 to 40 mm. required for the removal of a liquid. The low pressure is furnished by the contraction of the smooth muscle in the rectosigmoid; the higher pressures are supplied by the diaphragm and abdominal muscles.

The passage of the watery material requires only a slight relaxation of the anal sphincters and no work on the part of the other perineal muscles. The passage of the formed stool requires usually the bearing down of the abdominal muscles and the assistance of the levator and perineal muscles along with a more complete relaxation of the anal sphincters. Peristaltic activity and mass movement are factors in the mechanism of defecation but the motor power supplied normally by the colon in the act of defecation is small, compared with the force exerted by the voluntary muscles in this act.

Recently I have made some studies of the intra-abdominal pressures which can be brought about by normal individuals when they strain as in defecation. Healthy males without any tendency to constipation may exert a pressure of from 240 to 280 mm. of mercury. Athletic women may exert a pressure equal to 180 to 200. Women of the slender visceroptotic type with thin and relaxed abdominal muscles could exert a pressure of only 100 to 150 mm. This and local changes in the perineum (relaxation and rectocele) are probably very important in the constipation occurring in women after repeated pregnancies. The capacity of the abdomen has been increased and the tonus of the perineal and abdominal muscles has been decreased.

This suggests the value of exercising the abdominal muscles in the treatment of the constipation. It does not imply that constipated patients should strain at stool. Just as a precipitate labor produces injuries of the birth canal, so the forcible passage of hard dry constipated stools is productive of fissures, proctitis and hemorrhoids. When the stools are of normal consistency and the relaxation of the sphincters normal, the intraabdominal pressure during defecation need not exceed perhaps 80 to 100 mm. of mercury.

And now let me suggest some of the more practical considerations. Though constipation for its discussion is frequently divided into the spastic and atonic varieties, it is extraordinarily rare for us to see any evidence of real atony of the colon. For the most part the spastic type results from hyperactivity of the colon and the atonic type from a disturbance in the function of the anus or rectum. It is of little value to read in a clinical history a statement that the patient is constipated. In all patients who have abdominal complaints the clinical history of the behavior of the colon and rectum should be investigated. Hundreds of patients with right lower quadrant distress, who consider themselves constipated, are operated upon for "chronic appendicitis" and are not relieved of either the constipation or the distress (Fraser[11]). Many upper abdominal symptoms may be traced to irritability and spasticity of the colon. Sometimes it requires considerable clinical study to differentiate between gallbladder disease and a group of symptoms accompanying motor disturbances of the colon.

As has been recently mentioned by Smith and Miller, patients with what they term spastic colitis may have symptoms strongly suggestive of gastric or duodenal ulcer. They assign these symptoms to reflex pyloric spasm secondary to hyperirritability of the colon. It is not difficult to see how such symptoms as burning discomfort in the epigastrium may come at fairly regular intervals after meals, if we recall the normal gastroileac and gastrocolic or "feeding reflexes," as described by Welch and Plant. The already overactive colon is stimulated to greater activity, producing many different symptoms heightened by the feeding reflex. In most of these patients there is hyperactivity of the entire tract.

Intestinal obstruction, new growth and adhesions are some of the unwarranted diagnoses made in this group of patients. The nervous impulses may spread so far as to produce symptoms suggestive to the patient of heart disease, particularly when there are accumulations of gas in the transverse colon high under the ribs, and reflex aerophagia with attendant cardiac irritability from irritation and pressure beneath the diaphragm. In general, the symptoms of an irritable but otherwise normal colon may lead to a multitude of symptoms and suggest many different diseases, depending largely upon what part of the gut is most irritable and how we are diagnostically biased.

The most valuable information, apart from the history of the function of the bowel, is the observation of the stools. The gross appearances are usually characteristic. Abnormal caliber of the stool, that is, pencil-like, finger-like, ribbon-like as well as large oversized stools are usually indicative of irritability or failure of the anal sphincters to relax, either caused by reflex spasm from local rectal disease or resulting from bad habits. Mushy, gruelly and watery stools, with or without excess of mucus and gas, as well as lumpy and ball-like stools molded in the colon itself, are indicative of hyperactivity of the colon. Patients with any of these abnormal kinds of stool may complain of constipation. Neither the local rectal condition nor the malfunction of the colon calls for laxatives, enemas or a roughage diet. Soothing treatment, chiefly physiologic rest, is the underlying principle in therapy.

Time does not permit of a discussion of the dysfunction of the colon so frequently seen in nervous and hypersensitive individuals. We must not forget that the normal behavior of the colon is the result of a coordination controlled by the autonomic nervous system, and that the mental state plays a large part in the activity of the colon. Once I had a housewife as a patient who was always greatly annoyed by an uncontrolable diarrhea whenever she gave a party, though at other times her bowel function was normal. Constipation also may occur in disturbed mental states, due to a temporary imbalance of the autonomic control.

Roengten ray studies with a barium progress meal are often valuable in visualizing the disturbances of colonic motility. They help in the recognition of such organic diseases as ulceration, new growths and diverticuli. Frequently they serve as proof to the patient that there is no obstruction or abnormal delay in the passage. Thoroughness in the study of any patient is essential. This may require a number of procedures. The clinical picture may become clearer and typical symptoms of such diseases as duodenal ulcer or cholelithiasis may become obvious after the removal of such symptoms as are due to the colon. This is usually accomplished by changing the diet to a nonirritating low residue diet, withholding laxatives and enemas and administering suitable doses of belladonna. The milder degrees of true colitis usually respond to similar treatment. All patients with a story of constipation should at least have a digital examination of the rectum and at least the gross inspection of their stools.

Finally in closing, let us remember that the motor mechanism of the colon, though somewhat complex, performs remarkably well and rarely gets out of order until we abuse it or meddle with it. We cannot force nature but can coax her. Our aim in treatment should be the restoration of a normal physiology.

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# TUMORS OF THE URINARY BLADDER*

Alexander Hamilton Peacock, M.D., F.A.C.S.
SEATTLE, WASH.

Treatment of neoplasms of the urinary bladder still constitutes a serious problem. The object of this paper is to submit a review of the present treatment as employed by urologists in various clinics and medical centers.

Immediately the question is asked, "What do you mean by neoplasms of the bladder?" Heretofore the classification of these tumors has been legion. In an effort to be scientific and accurate, many of them split hairs over types, arrangements and proportions of cells. Young's classification, which covers the field well, is an ideal histologic grouping.

I. YOUNG'S CLASSIFICATION OF BLADDER TUMORS
  B—benign. M—malignant
  1. Organoid
    A. Epithelial:
      (a) Adenoma
        Solid (B)
        Cystic (B)
    B. Mesothelial:
      (a) Angioma
        Hemangioma (B)
        (Lymphangioma)
  2. Histoid
    A. Epithelial:
      (a) Papillary tumors
        Benign papilloma (B)
        Malignant papilloma (M)
        Papillary carcinoma (M)
      (b) Adenocarcinoma (M)
      (c) Epithelioma
        Squamous-cell or epidermoid (M)
        Non-squamous (basal cell) (M)
    B. Mesothelial:
      (a) Sarcoma
        Round-cell (M)
        Spindle-cell (M)
        Giant-cell (M)
      (b) Fibroma (B)
      (c) Lipoma (B)
      (d) Leiomyoma (B)
        (Lymphosarcoma)

II. HETEROTOPIC TUMORS
  1. Embryoma:
    (a) Dermoid cyst (B and M)
    (b) Teratoma (B and M)
    (c) Rhabdomyoma (B)
    (d) Chondroma (B)
    (e) Myxoma (B)

III. EXTRAVESICAL TUMORS
  Retrovesical sarcoma

After a patient has been informed that he has a tumor of the bladder, his first question is, "doctor, is it a cancer," which question calls for a definite answer. The laity has been educated as to the gravity of cancer and make their plans for the future accordingly. This naturally divides all the bladder tumors into two groups, benign and malignant. The first step is a study of the benign group.

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As the mucosa is composed of epithelium, it is in order to note that 90 to 95 per cent of all bladder tumors are composed chiefly of epithelial cells. This being the case, all other tumors, as leiomyomata, sarcomata and dermoids will not be discussed.

The outstanding benign tumor of the bladder is the so-called papilloma. These are single or multiple stalks which project from the mucosa and have branches or fronds. They are highly vascular, with a tree-like blood supply. These growths have a basic membrane with layers of stratified, columnar and squamous epithelium, the same as the bladder itself. They may be so small as to be just visible or large enough to occupy the entire bladder cavity. They are characterized by a strong tendency to transplant themselves, have a fine, indefinite line between malignancy and innocent development, and invariably recur unless well destroyed.

Boyd states, "No field of microscopic diagnosis gives less satisfaction to the pathologist than bladder tumors. Degeneration can start anywhere in the papillomata." He further states that every bladder tumor is potentially malignant. This view is concurred in by West, Corbus, Young, Lowsley, Barringer, Cunningham, Frontz, Braasch and others. No other conclusion could be drawn when the universal tendency to recur is noted and how these growths get entirely out of control when untreated. Pieces of the tumor secured by rongeur or cystoscopic manipulation give no accurate pathologic information. All the pathologist can say is that the piece submitted to him was benign or malignant according to the cell arrangement. Of the stalk base or fronds of the tumor we have no histologic information.

Obviously a complete preoperative histologic examination of the bladder tumor is impossible. Even a pathologist of Boyd's caliber comes to the conclusion that "the cystoscopic appearance of the tumor is more reliable than a partial tissue examination to determine the presence or absence of malignancy." The suggestion is made that we leave the rare tumors to the textbooks and the pathologists, and that the urologists and surgeons confine themselves to a strictly clinical diagnosis, depending on the cystoscopic appearance of the tumor.

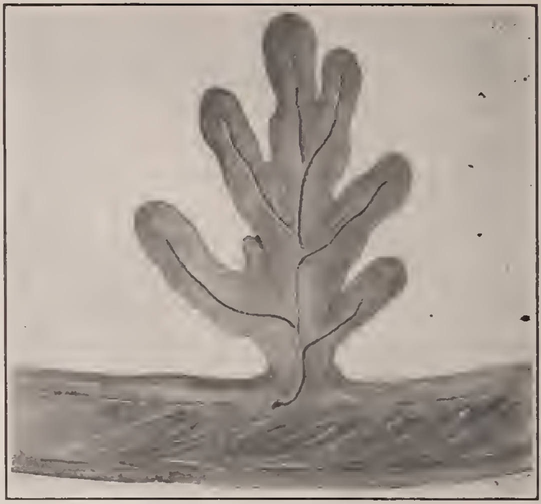

Fig. 1. Group 1. Benign papilloma.

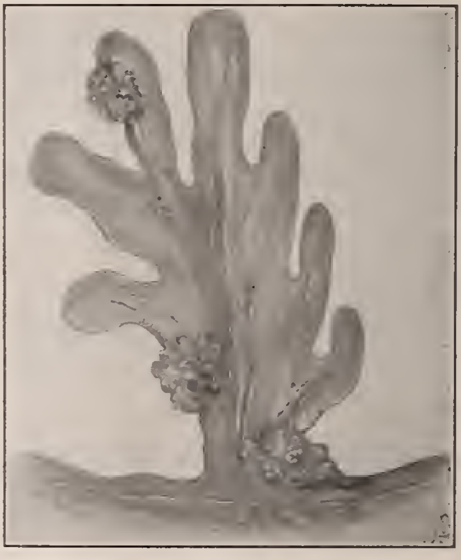

Fig. 2. Group 2. Carcinomatous papilloma .

### SUGGESTED CLINICAL CLASSIFICATIONS

Group 1. Benign papillomata. This comprises small or medium sized finger-like tumors, single or multiple. When small, these invariably are histologically nonmalignant. They are most easily controlled by electric coagulation or cautery (fig. 1).

Group 2. Carcinomatus papillomata. This group embraces the degenerative papillomata which break down in some portions of the tumor and become true carcinomata. The degeneration may occur in the stalk or fronds. According to Broder's cell classification, they are usually type 1 and type 2 (fig. 2).

Group 3. Sessile and infiltrating carcinomata. These growths are nodular upheavals of the bladder wall, with an irregular broad base. At times ulcerative or necrotic areas are noted (fig 3).

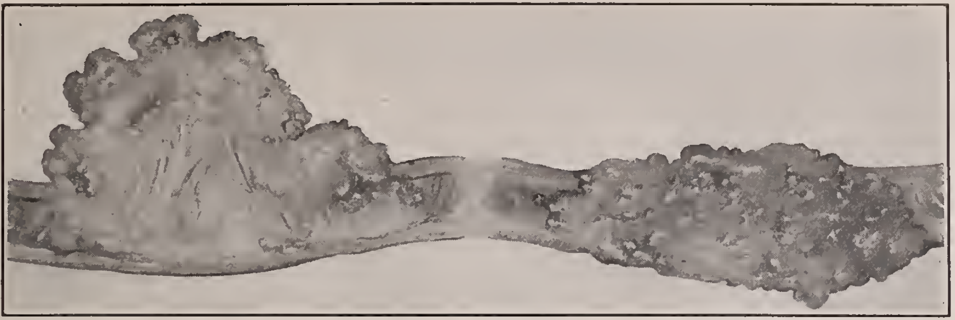

Fig. 3. Group 3. Sessile and infiltrating carcinoma.

The infiltrating type often appears as a chronic inflammation of the mucosa, with an easily bleeding granular surface somewhat resembling raw beef. Cystoscopically the margins are often poorly defined. The major part of the growth is in the bladder wall and extends to the perivesicle tissues. These are invariably types 3 and 4.

The above classification will include 95 per cent of all bladder tumors and seems to be a rational clinical division. As the transition from group 1 to group 2 is so insidious and occurs so frequently if unchecked and given sufficient time (five to ten years), it is probable that in the future all papillomata of the bladder will be classified as carcinomata, the simple papillomata being considered a precancerous or inactive cell arrangement. Certainly with our clinical experience of recurrence and cell transplantation, these benign papillomata have cancer properties.

### SURVEY OF THE LITERATURE ON TREATMENT

The types of treatment employed have been excision, cautery, electrocoagulation (diathermy and fulguration), chemical coagulation, deep roentgen therapy and radium. Surgeons are now able to report some of their results from the various forms of treatment, as there are sufficient follow-up records available which allow us to come to some very definite conclusions.

Outstanding is the series of 622 cases treated at the Brady Urological Institute and reported by Scott and MacKay. Over half of these tumors were classified as infiltrating carcinomata, with seventy-five diagnoses benign. All types of treatment were used. Of the benign tumors treated by electric coagulation 30 per cent were reported well and 20 per cent symptomless; 40 per cent were dead or not followed. These figures are not the final for most of the cases are for less than five years observation. The final judgment of results should be withheld until the ten year period has passed, as these tumors will recur and malignancy is frequently slow.

Combined radium and fulguration treatment gave 22 per cent apparently cured and 18 per cent with symptoms; unimproved, dead and not followed, 50 per cent. These figures are not as good as from electrocoagulation alone. It must be remembered, however, that in all of these tables there is no method of determining the size or rate of growth of the tumor, both of which are most important factors. It is further well known that tumors occupying the vesicle orifice and trigone are apt to be far more troublesome than those occupying the dome or lateral walls.

The transurethral implantation of radium plus electrocoagulation gave improved results with apparently 35 per cent of cures in malignant papillomata. In the group of forty-nine cases of infiltrating carcinomata we find at the end of four years eight are reported well. Again, the size of the tumor was not given.

Implantation of radium through suprapubic cystotomy was employed in 28 cases; 3 are reported well and 75 per cent were dead or not improved. Resection of the tumor, 64 cases; 30 per cent were well after one year and 15 per cent after five years. In Young's opinion, resection and radium is the most satisfactory form of treating infiltrating carcinomata.

Suprapubic cauterization was employed in 35 cases; 20 per cent apparently were well. This works best in types 1 and 2. Deep cauterization gave poor results on account of infection and the slough.

Roentgen treatment (that is, deep therapy). The results were poor and the reactions sometimes severe. Out of thirty-two cases, three were symptomless and three cystoscopically well. The balance either recurred or the patient died. It does, however, relieve pain when due to nerve involvement.

Bumpus gives the experience of the Urological

Department of the Mayo Clinic. He describes the lack of uniformity in classification, notes the wide variety of treatment and the poor results. In his review of 527 cases the forms of treatment were resection, radium, electrocoagulation, cautery and suprapubic cystotomy. The radium mortality was 14.7 per cent. Out of 19 cases treated with radium alone, 13 died before the third year. This duration was no longer than the untreated cases. Cauterization was found useful in the types of low malignancy.

Broder's classification of malignancy was used throughout. Excision and resection was employed in 240 cases; 76 per cent died within two years. Small tumors of grade 1 and 2 were treated with electrocoagulation with 33 per cent of recurrences.

In Crenshaw's opinion the end-results depend entirely upon the grade of malignancy. Frontz, who has contributed several excellent papers to the subject, feels that a clinical classification of these tumors is more important than a histologic one. Dividing his cases into two groups, benign and malignant, he feels that the size, rate of growth and the cystoscopic appearance of the tumor are the real factors. Due to the presence or absence of infiltration of the bladder wall, the treatment is varied between radium, fulguration and cautery.

Bumpus, in his treatment of small tumors, grades 1 and 2, employed electrocoagulation and checks them up every two or three months; later every six months. For grades 3 and 4, he uses the cautery as a palliative measure and for those of a low degree of malignancy. Radium employed transurethrally and transvesically in his experience was not successful, due to secondary cystitis and a radium mortality. Diathermy or electrocoagulation applied suprapubically for grades 3 and 4 in the last series of twenty-nine cases (followed eighteen months) showed sixteen living. He winds up his paper suggesting a simple classification, cystoscopic reexamination of all patients periodically, and states that radium alone gives poor results but radium combined with other treatments was useful.

Eisendrath points out the great importance of painless hematuria as an early sign of bladder tumor and of the great value of electrocoagulation as a mode of treatment.

Hirsch believes in the value of roentgen ray, diathermy and radium. He reported that out of sixty-three cases 8 per cent were alive at the end of six years; in another series 7 per cent were alive after six years. Hirsch winds up by favoring an open operation.

Barringer in twenty-nine cases at the Mt. Sini Hospital, New York, reports with radium treatment alone 50 per cent dead and recurrences. Keyes in a small series of cases reports excellent results from the radium emanation seeds.

Joseph of Berlin introduced trichloracetic acid under the name of chemical coagulation and reported fifty cases treated in his clinic with satisfactory results.

Cunningham is of the opinion that it is most difficult to tell when a tumor is benign and when it is malignant, feeling that the reaction to the treatment will tell the story. Morrison favors an open operation and diathermy, later treating transurethrally for any recurrences. Judson states that inflammatory lesions of the bladder often simulate neoplasms and that at times a chronic irritation may develop into a true new growth.

Schlagintweit of Munich reports a series of 84 nonmalignant tumors, 34 malignant and 22 suspicious; 102 occurring in men and 38 in women at the average age of fifty-five. Of this group, 3 cases only were favorable for operation, these being on the anterior wall. He states that the diagnosis was often difficult; that hemorrhages were reported in these cases from seven to twenty-four years previously. Out of 102 cases, 54 were inoperable and 48 were dead. Out of his first group of 84 patients only one was cured, the longest living was nine years. Out of 34 cases treated by electrocoagulation, 7 were cured. His best results were obtained from electrocoagulation alone.

Corbus says that the trend of opinion is to consider the majority of papillomata malignant. In his experience, 50 per cent of them occurred near the ureteral orifice. His favorite treatment is electrocoagulation and very little surgery.

O'Conner reports 50 cases. He frankly feels that all bladder tumors are malignant. Out of his 59, 39 of them occupied the base of the bladder. Out of 50 cases 20 were apparently cured up to four years.

Beer reports 158 benign cases treated by electrocoagulation. In these there was a 20 per cent recurrence. Twenty-eight cases of papillary carcinoma had an operative mortality of 14 per cent, with recurrence of 25 per cent (37 cases). Infiltrating carcinoma had an operating mortality of 20 per cent and a recurrence of 43 per cent. He has obtained good results with radium seeds and electrocoagulation. The open implantation of radium had the highest mortality, 33 per cent. With deep roentgen therapy of 17 cases only 3 papillary carcinomata were relieved of pain or dysuria.

Nagley reported 105 cases from the Los Angeles County Hospital. Ninety-two were papillary carcinoma, 12 scirrous cancer and one sarcoma. Out of these series, 52 were dead.

The present study of tumors of the bladder is based upon a series of eighty-seven cases treated by the author (table 1). The strictly benign papillomata, classified here as group 1, were made up of the small finger-like growths. The treatment consisted of electrocoagulation transurethrally. Usually three to four sittings were necessary and they were observed cystoscopically over a period of three years at six months intervals. The results were uniformly good. Small recurrences frequently were noted but responded to another application of electrocoagulation (table 2).

TABLE 1. BLADDER TUMORS

| | *Age of Incidence* | | |
|---|---|---|---|
| | Youngest | Oldest | Average |
| Males (59 cases) | 32 | 82 | 58 |
| Females (26 cases) | 43 | 72 | 57 |

TABLE 2. TYPES OF TUMORS AND TREATMENT USED

| | *Benign* | *Malignant* | |
|---|---|---|---|
| Treatment | Papilloma | Papilloma | Sessile |
| Fulguration alone | 19 | 1 | 3 |
| Fulguration plus radium | .... | 1 | .... |
| Fulguration plus deep roentgen ray | 1 | .... | 1 |
| Resection (alone, radium, roentgen ray) | .... | 2 | 6 |
| Cauterization alone | .... | 12 | 5 |
| Cauterization plus roentgen ray or radium | .... | 3 | 4 |
| Roentgen ray alone | .... | .... | 3 |
| Radium alone | .... | .... | 1 |
| | — | — | — |
| | 20 | 19 | 23 |

Carcinomatus papillomata, designated as group 2, were treated by excision, cautery, electrocoagulation, radium and deep roentgen therapy. A typical case is as follows:

Case 1, 12004, male, 39 years of age, a bookkeeper by occupation and with a negative carcinoma history. The admitting complaint was hematuria. Two years ago he observed a painless hematuria once; there was no frequency of urination and no dysuria. Three weeks ago he had an attack of frequent urination, and a week later some discoloration of the urine. Since that time he has been bleeding slightly intermittently. At the present time there is terminal spasm and the passage of small blood clots. The general health has been good.

The general examination shows an apparently healthy male with no pathology excepting a slight enlargement and induration of the seminal vesicles.

Cystoscopic examination shows a papillomatous growth 2 by 3 cm., occupying the right edge of the trigone. The surface in certain areas is red, ulcerative and peppered with phosphatic deposits. Around the vesical orifice there are several small daughter growths, also papillomatous in appearance.

Operation: Suprapubic cystotomy. Tumor with a pedicle occupying the area just above the right ureteral orifice. This was removed with a cautery and the base well cooked. A smaller growth was also removed from the edge of the left vesical orifice in the same manner.

The pathologic report states that the tissue was friable and that the section shows a papillary stroma. Many projections are covered with only a single layer of epithelium, while others have in some areas fifteen layers. Diagnosis, malignant tumor of the bladder.

Six months later this patient was cystoscoped and no evidence was found of any growth. Twelve months after the operation another cystoscopic check up was made and still no evidence found of the growth. Two years and three months after the operation a small papilloma 1 by 1 cm. was observed in the dome and probably was at the point of the cystotomy incision. This was treated by electric coagulation. Two months later, two small growths in the dome were treated in the same manner. Four months later, one small growth was still noted in the dome of the bladder and again treated by electrocoagulation. The site of the original tumor was healthy and showed no evidence of the smaller growths. The last examination was made six months later, March 25, 1929. A small growth was still noted in the dome of the bladder. This was again coagulated.

This case illustrates the slow rate of growth of some of these tumors and the strong tendency to recur. It likewise shows the power of electrocoagulation to destroy definitely malignant tumors and keep them under control. This type if untreated may rapidly develop into an infiltrated carcinoma.

Sessile and infiltrated carcinomata, group 3, are the most interesting of all, as they present the greatest problem. For that reason several will be reported.

Case 2, 11265. This patient was 48 years of age, male, with nothing of interest in the family history excepting one brother died of pulmonary tuberculosis. His past medical history consists of an attack of influenza in 1918 of a severe type and a right herniotomy two years ago which was successful. He admitted having a Neisserian infection when a young man.

This patient applied for examination March 3, 1925. He stated at the time that two months ago he noticed the first hematuria which was accompanied by acute pain. He was cystoscoped by Dr. A. E. MacKay of Portland, Ore. At this time a small papilloma below the right ureteral orifice was treated by electrocoagulation and the bleeding stopped.

Wishing to check up his condition a cystoscopic examination was made. A slight ulceration was noted around the right ureteral opening. The bladder was trabeculated. The catheterized kidney urines were negative. Three weeks later another observation was made of the bladder. The ulceration had healed over and there was no evidence of growth. Pyelograms were made at this time and showed no pathology of the upper urinary tract.

On October 8, 1928, three and one-half years later, this patient returned with a story that he had been bleeding for several months but on account of business activity he could not spare the time to attend to it before. Examination of the bladder at this time showed a tumor occupying the right base and extending well towards the edge of the vesicle orifice; it was about 2 by 2 cm. in size, nodular and necrotic.

He postponed surgery which was advised, so a coagulation was attempted. He still continued to bleed and did not return until another two months. At this time the growth was decidedly necrotic and considerably larger. He was bleeding so much that clots of blood plugged up the urethra. Severe colic pains had developed in the right side and back. Three weeks later he finally consented to hospitalization.

Under a sacral anesthesia a suprapubic cystotomy was performed. This tumor occupied the right base of the bladder and extended to the right vesical margin. A resection was made of the growth, going through the entire thickness of the bladder. The wound was then closed by suture. Fifty mgm. of radium were implanted in the end of an indwelling catheter and 8 mgm. hours were given. The pathologic report was carcinoma, type 3.

He apparently made a good convalescence until three weeks later, when he was taken with a violent chill, cough, and became cyanotic, dying on December 7.

The interesting part of the autopsy was the right kidney, which contained many abscesses, varying in size from 1 mm. to 1 cm. The left kidney showed an acute parenchymatous degeneration but no abscesses. The right ureter was shut off at its vesical junction by the carcinoma. Both lungs showed multiple abscesses.

Death was due to ascending pyelonephritis of the right side, septicemia and multiple abscesses of the lung. Primary cause of death was carcinoma of the bladder.

The interesting point of this case was the insignificant beginning of this tumor, the apparent long period of rest and then its sudden rapid growth.

Case 3, 14024. This patient was a woman, 59 years of age, who complained of a painless hematuria. She was first seen and examined on May 16, 1928. Her family and medical history was negative except for an attack of malaria in 1908, at which time she noticed blood in her urine. She stated that she next observed hematuria eighteen months ago which lasted for eight weeks. This was apparently cured by some medicine she took by mouth. Three months later there was just one showing of blood in the urine. She had never been troubled with frequency or burning and had no pain.

Cystoscopic examination on May 16 showed an irritated bladder with a tumor occupying the right wall and base. This tumor was lobulated and rough, had a broad base and was about 3 by 3 cm. in size.

The ureters were catheterized and the kidneys found to be normal. Vaginal examination could not demonstrate any tumor or thickening of the anterior vaginal wall.

The patient elected to try electrocoagulation for her treatment. This, however, made so headway in the course of four months; the bleeding increased and the hemoglobin fell to 40 per cent, with erythrocyte count of 2,120,000. On account of vesical hemorrhages, surgery was finally consented to.

A blood transfusion was given. Immediately following this, under sacral anesthesia, a suprapubic cystotomy was done. A friable tumor mass occupied the right base of the bladder anterior to the ureteral orific; it measured 2 by 3 cm. There was bleeding from many points. The major portion of the tumor was removed with forceps and the base was well coagulated by the cautery.

The pathologic diagnosis was cancer of the bladder, type 3. Up to the present time there has been no recurrence and the bladder appears normal (fig. 4).

Case 4, 14158. This patient was a male, 56 years of age. His family and medical history were negative excepting for an extremely severe attack of Neisserian infection at eighteen. At the height of this infection he suffered with multiple arthritis. This cleared up and there has been no recurrence.

He first applied for advice on July 4, 1928, stating that for the past week he had been ill with fever, frequent, painful urination and soreness through the bladder. He had also suffered with diarrhea, complaining that the stools had a strong, offensive odor. His temperature at this time was 102°. He apparently was suffering with an acute intestinal and urinary infection.

The urine was turbid and contained pus cells and many colon bacilli. A rectal examination was made and the prostate apparently was normal. The cystoscopic examination of the bladder showed an acute infection with no evidence of tumor.

Under urinary antiseptics this attack passed off and the urine became perfectly clear and the patient was symptomless. He then made a motor trip of two months. On his return he complained again of bladder irritability. Four months after the initial symptoms in July examination was made under general anesthesia. A high rectal examination demonstrated an irregular indurated growth posterior to the bladder. Proctoscopic examination showed no ulceration of the rectal mucosa or any new growth.

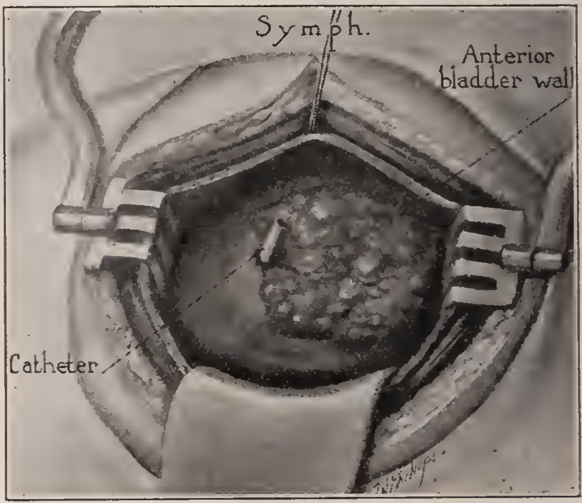

Fig. 4. Carcinoma of the bladder, type 3. Long standing hemorrhage and marked secondary anemia. Treated with galvanocautery.

Cystoscopic examination showed a contracted bladder; it could not be expanded. The right base was occupied by a slightly heaped mass of tissue; it was difficult to make out any definite border. A few days later a barium enema was given and showed an imperfect filling of the rectal sigmoidal junction.

A diagnosis was made of infiltrated carcinoma of the bladder.

On November 14 a suprapubic cystotomy was made under nitrous oxide anesthesia. In the right base of the trigone was a flat tumor-like mass, whose surface was granular and resembled raw beef, bleeding readily. The base of this tumor was removed for examination. This tumor mass was 2½ by 3 cm. and was apparently 2 cm. thick. It could be palpated beyond the bladder to the rectal sigmoidal junction. Resection was out of question. The growth was treated by deep cauterization. Radium needles were implanted in the growth for eleven hundred millimeter hours (figs. 5a and 5b).

The pathologic report of miscroscopic section showed cells as reverted to the embryonic type. There were many [illegible] present.

Diagnosis: Neoplasm of the bladder, malignant, type 4. One month later the wound was entirely healed and the patient voided naturally. From then on, however, he began to fail in strength and suffered considerable pain, chiefly in the lower abdomen. Death occurred four and one-half months after the operation. At this time the wound had opened again and a large, recurrent tumor appeared on the abdomen.

The author has nothing new to recommend in the line of treatment but wishes to make a survey of his small series of cases and give some deductions.

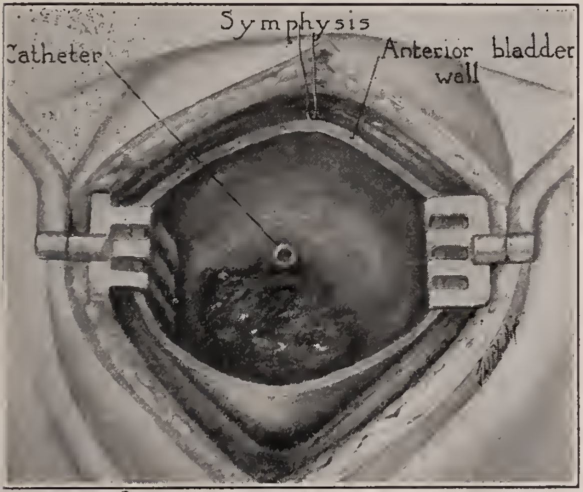

Fig. 5a. Infiltrating carcinoma of the bladder, type IV, invading the perirectal space, seminal vesicles and prostate. Treated with radium.

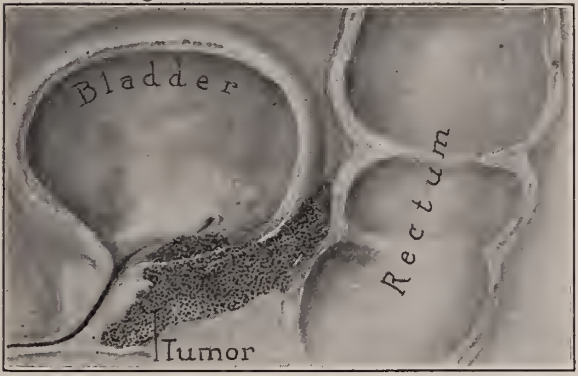

Fig. 5b. Transverse section showing relation of tumor to bladder and rectum.

Fifty-nine cases were male and twenty-six were female. The youngest male was thirty-two years of age and the oldest eighty-two. The youngest female was thirty-five years of age and the oldest fifty-seven (table 3).

Simple papillomata, or group 1, were invariably treated with electrocoagulation. Corcinomatous papillomata, or group 2, were treated by suprapubic cystotomy, then cauterization and radium, resection and radium and electro-coagulation plus radium. The best results obtained in this group were with cystotomy and cauterization, and later checking any recurrence by transurethral electrocoagulation (table 4).

Sessile and infiltrated carcinomata were treated by resection plus radium, cauterization alone, cauterization plus roentgen ray or radium, roentgen ray alone, electrocoagulation alone and radium alone (table 5). The best results were obtained in this group by resection when the tumor was small and located in the fundus or posterior wall of the bladder. The second best results were obtained by cauterization, followed later by radium implantation (table 6). Deep roentgen therapy and electrocoagulation give poor results. Radium alone was unsatisfactory, either because it was not used prop-

TABLE 3. RESULTS OF FULGRATION ALONE (23 CASES)

| | *Years postoperative* | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | —1 | 1 | 2 | 3 | 4 | 10 | Cases |
| Alive and well cystoscopically | 3 | 1 | .... | .... | .... | 1 | 5 |
| Alive and well, symptomless | 3 | .... | 2 | 3 | 1 | .... | 9 |
| Recurred, retreated, improved | .... | 1 | 1 | .... | 1 | .... | 3 |
| Recurred, unimproved | 1 | .... | 1 | .... | .... | .... | 2 |
| Recurred, dead | 1 | .... | .... | .... | .... | .... | 1 |
| Dead, other causes | 1 | .... | .... | .... | .... | .... | 1 |
| Not followed | 2 | .... | .... | .... | .... | .... | 2 |

TABLE 4. RESULTS OF GALVANOCAUTERY PLUS DEEP ROENTGEN RAY OR RADIUM

| | *Years postoperative* | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | —1 | 1 | 2 | 3 | 4 | 5 | Cases |
| Alive and well cystoscopically | .... | .... | .... | .... | .... | .... | .... |
| Alive and well, symptomless | .... | .... | .... | 2 | .... | .... | 2 |
| Recurred, retreated, improved | 1 | .... | .... | .... | .... | .... | 1 |
| Recurred, unimproved | .... | .... | .... | .... | .... | .... | .... |
| Recurred, dead | 3 | .... | .... | .... | .... | .... | 3 |
| Dead, other causes | .... | .... | .... | .... | .... | .... | .... |
| Not followed | 1 | .... | .... | .... | .... | .... | 1 |

TABLE 5. RESECTION RESULTS, SUPPLEMENTED BY ROENTGEN RAY OR RADIUM

| | *Years postoperative* | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | —1 | 1 | 2 | 3 | 4 | 5 | Cases |
| Alive and well cystoscopically | .... | .... | .... | .... | .... | .... | .... |
| Alive and well, symptomless | .... | .... | .... | .... | .... | .... | .... |
| Recurred, retreated, improved | .... | .... | .... | 1 | .... | .... | 1 |
| Recurred, unimproved | .... | .... | .... | .... | .... | .... | .... |
| Recurred, dead | 3 | .... | .... | .... | .... | .... | 3 |
| Dead, other causes | .... | .... | .... | .... | 1 | .... | 1 |
| Not followed | 3 | .... | .... | .... | .... | .... | 3 |

TABLE 6. RESULTS OF CAUTERIZATION ALONE (Cystotomy and galvanocautery)

| | *Years postoperative* | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | —1 | 1 | 2 | 3 | 4 | 6 | Cases |
| Alive and well cystoscopically | .... | .... | .... | .... | .... | .... | .... |
| Alive and well, symptomless | 3 | .... | .... | .... | .... | .... | 3 |
| Recurred, retreated, improved | .... | .... | 1 | .... | .... | .... | 1 |
| Recurred, improved | .... | .... | 1 | .... | .... | .... | 1 |
| Recurred, dead | 4 | 1 | 1 | 1 | .... | 1 | 8 |
| Dead, other causes | .... | .... | .... | .... | .... | .... | .... |
| Not followed | 4 | .... | .... | .... | .... | .... | 4 |

erly or sufficient dosage was not employed. The figures and tables given by writers so far have very little value because the size of the tumor in these tables is never given, which is of tremendous importance, as the smaller the tumor the better the results and prognosis.

The second point of fallacy is a failure to note the exact location of the tumor within the bladder, the exact extent of the growth, whether it is limited to the mucous membrane or whether it has spread through the bladder wall into the surrounding tissue.

The third fallacy in the reports is the lack of an index to tell how rapid is the growth of the tumor. It is a well known fact that a malignant tumor of apparently slow development will suddenly take on a very rapid growth after surgery has been performed. This is true of cancer in any part of the body.

The fourth fallacy is the period over which the patient is observed, following treatment. Many of these patients present an apparent cure from one to three years, but after this the growth may suddenly reappear with increased intensity. No tumor of the bladder should be considered cured under a ten year period of observation.

The purpose of all surgical remedies to eradicate tumors of the bladder is complete destruction of the tumor cells. This effort has been made in several ways, first by complete excision of the tumor mass, extending the resection into the healthy tissue. As the results show, this is not often accomplished. All the other methods have aimed at destroying the carcinoma as it lies embedded in healthy tissue by means of heat from a soldering iron, galvanocautery, electrocoagulation (fulguration), chemical coagulation with trichloracetic acid, radium and deep roentgen therapy.

For years carcinoma of the breast was treated with arsenic paste which accomplished the same end, destroying the tumor and a certain amount of healthy tissue. These cases had some cures to their credit. A vital factor is observing the growth when it is quite small, at which time there is very little liability of cancer cells getting far beyond the growth.

Another item of great importance is to employ treatment which has the minimum amount of risk and in itself inflicts the least trauma to the patient. Electrocoagulation aplied through the cystoscope seems to be the most useful treatment so far. Unfortunately, surgeons cannot see these cases always under favorable conditions. These tumors may exist for years without recognition and only be brought to the operating table on account of severe vesical hemorrhage. The surgeon has no choice but to do a suprapubic cystotomy and treat the tumor as his skill and experience indicate.

## SUMMARY

1. Ninety per cent of all bladder tumors are of epithelial origin, and 85-90 per cent are malignant.

2. Epithelial tumors of the bladder have a great tendency towards degeneration and becoming carcinomatous. It is a debatable question among pathologists whether benign papillomata do not all become malignant in time.

3. It is suggested that a clinical classification of bladder tumors be indicated as: group 1, benign papillomata; group 2, carcinomatous papillomata; group 3, sessile and infiltrated carcinomata.

4. It is recommended that the treatment of these tumors be simplified, using radium emination needles or fulguration transurethrally for the small growths. For the larger ones when hemorrhage is present, suprapubic cystotomy, resection of the growth if in a favorable location of the bladder, and galvanocautery when it is not.

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**UNDULANT FEVER.** Sixty-three cases of undulant fever have been discovered in and about Dayton, Ohio, during the past year, according to Walter M. Simpson and Eunice Frazier, Dayton, Ohio (*Journal A. M. A.*, Dec. 21, 1929). The rapidly increasing number of reported cases in the United States indicates the seriousness of this disease as a public health problem. Contrary to previously expressed beliefs as to the difficulties encountered in making a clinical diagnosis of undulant fever, the clinical picture of the disease was sufficiently characteristic to enable several physicians to make an initial diagnosis of undulant fever in more than one-third of the authors' cases. There appears to be no etiologic factor other than the ingestion of raw milk and unpasteurized dairy products in the cases studied. No cases of direct porcine or caprine origin were encountered. *Brucella abortus* was recovered from the blood of five patients suffering acutely from the disease. The organisms were found to be serologically identical with the strains recovered from the milk of five cows supplying raw milk to these patients. The blood serum of five women who had aborted repeatedly was found to agglutinate *B. abortus* and *B. melitensis* in high titers. All were raw milk consumers. In three human cases of suppurating seminal vesiculitis, prostatis, epididymitis and orchitis, antiabortus agglutinins were present in high titer. The organism was recovered from a draining sinus tract of the scrotum in one case.

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# TRICHOMONAS VAGINALIS*

## A CAUSE OF VAGINITIS

ALBERT MATHIEU, M.D., F.A.C.S.
PORTLAND, ORE.

Recently attention has been called to the fact that a number of hitherto incurable cases of vaginitis have been due to infection by the protozoan parasite, trichomonas vaginalis, and have responded favorably to specific treatment. This infection usually presents a fairly constant clinical picture and the organism is very easily demonstrated microscopically.

To date there has been no decision made as to whether the trichomonas found in the vagina are the same as those found in other parts of the human body, although some explanations of the source of infection, i.e., from the anus and from coitus, assume that this is so. The organism has been found in conjunction with gonorrhea and other vaginal and cervical infections and during pregnancy, but no definite relationship has been established, and in many cases it is the only demonstrable cause of infection.

### TECHNIC OF DEMONSTRATING ORGANISM

The discharge to be examined for trichomonas should be taken from high in the vaginal vault. It may be collected on a metal loop, a cotton swab or a gloved finger. A small amount of the discharge is placed on a cover slip and, unless very thin and watery, immediately diluted with one drop of normal saline. The preparation is then examined by means of a hanging-drop slide under both the low and high powers of a microscope. Care should be taken not to allow the discharge to become dry before diluting it with the saline solution, as the organism is most easily recognized by its motility, and drying causes its death.

This species of trichomonas was discovered by Donne in 1837 in the vaginal secretions of women, and described by Kunstler in 1884, Dock in 1894, Bensen in 1912, Reuling in 1921, Kofoid and Swezy in 1921, Lynch in 1922, J. P. Greenhill and Carl Henry Davis in 1928 and 1929.

### MORPHOLOGY

According to Craig the organism may be pyriform, fusiform, spheroidal, ameboid, but is typically pear-shaped with rounded anterior end and pointed posterior extremity. The size varies, but ranges from 15 to 25 microns in length and from 10 to 15 microns in breadth. It is actively motile, progressive in character, and ameboid motion has been observed in some of the more quiescent forms. This last is probably a degenerative characteristic. In living specimens the body is colorless, finely granular, and shows numerous food vacuoles.

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* Read before Portland City and County Medical Society, Portland, Ore., Oct. 16, 1929.

There is a definite undulating membrane running in a spiral manner across the body, and four flagella which can be counted accurately in stained specimens. Greenhill gives a more detailed description of the organism and says that the flagella arise in pairs, are approximately of the same length, and are more than half as long as the body of the organism. The point of origin of the flagella is a group of large blepharoplastic granules, and at this point the capsule is retracted. Starting from another dark granule at the base of the flagella, an undulating membrane runs somewhat spirally along the entire body to the posterior end, which is usually somewhat pointed. Between the origin of the flagella and the undulating membrane is a light tubular organ.

In the fresh hanging-drop preparation the organism is in constant motion, the movement of the flagella being similar to that of a fishing-line when cast. By means of this motion the flagella force bacteria, cellular debris and the fat droplets toward the tubular organ where they disappear; hence this is most likely the mouth. Locomotion is independent of the flagella, but dependent on the undulating membrane, which is always found on the side where it can move freely. Occasionally, however, locomotion takes place by ameboid motion, although this is also used for purposes of phagocytosis of leukocytes and bacteria. The organism may be stained by the gram method, if the contrast solution is left on a little longer than usual. For making slides the discharge high up in the vault should be used, not that which is on the surface of the vulva (fig. 1).

Trichomonas vaginalis nearly always lives in symbiosis with other organisms, most often gram-negative cocci which are smaller than gonococci. The gas bubbles present in the discharge in many cases of this type of infection are due, according to Schroder, Loser, Schmid and Kamniker, to these micrococci. Greenhill finds association between trichomonas and gonococcci very rare. I have found it in three cases. In one of these cases the trichomonas were found at the same time as the gonococci, and in the other two trichomonas were found to be the cause of a persistent discharge after the disappearance of the gonococci. The trichomonas infection is not treated when there is an active gonorrhea.

Without any special precautions, trichomonas vaginalis may be kept alive at room temperature for several hours. They are rather difficult to culture, and the results are uncertain. Davis, with the assistance of the bacteriologist at Columbia Hospital, Milwaukee, Wis., succeeded in obtaining fairly successful cultures, using Locke's solution and 5 per cent human serum, and incubating the cultures at 37° C. for twenty-four hours.

He used the following method to determine the toxicity of various drugs to trichomonas vaginalis: "a small loop of culture medium containing a large number of active trichomonas was placed on a slide and a like amount of the solution to be tested mixed with it." As a control the cultures were tested for motility in distilled water for fifteen minutes. The time required for cessation of motility was then recorded. The most effective of the solutions tested were gentian violet 0.1 per cent, mercurochrome 5 per cent, glycerine 50 per cent, alcohol 25 per cent, lactic acid 2 per cent, Lugol's solution 1 per cent, bichloride of mercury 1-5000, metaphen 1-500, green soap dilutions to 0.1 per cent, sodium hydroxide N/10 (one-tenth normal), silver nitrate 2 per cent. I have given the weakest solutions which were successful.

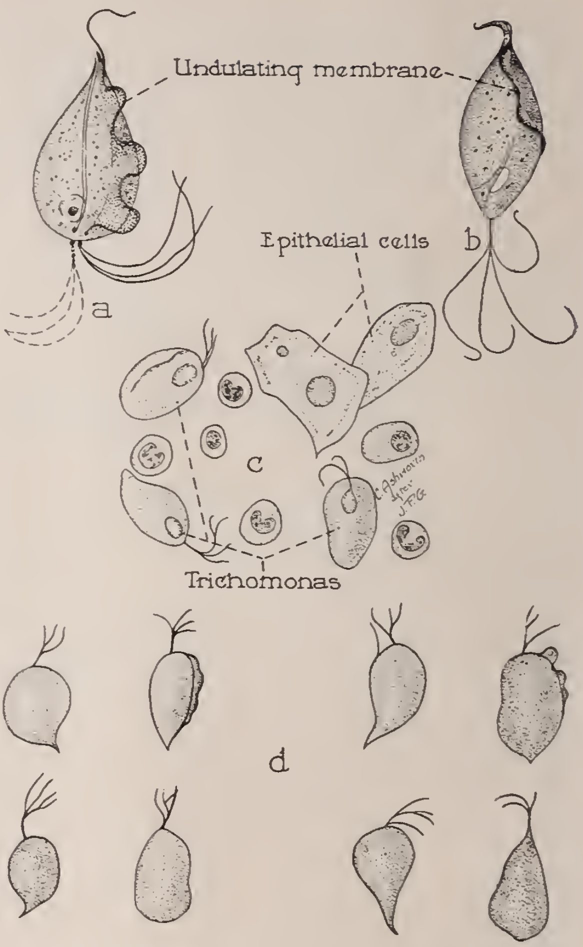

Fig. 1. a. Shows the essential structures of the trichomonas vaginalis. (From Greenhill after Rodenwaldt.)
b. Copy of drawing taken from Craig's book.
c. Gram stain, showing the relationship of size and shape of trichomonas to epithelial cells and leukocytes. (After J. P. Greenhill.)
d. Simple outline drawings of various shapes and views of trichomonas. (After J. P. Greenhill.)

## CLINICAL PICTURE

Craig says this flagellate occurs only in the vaginal secretions from diseased mucous membranes. It occurs not only in acid mucus, but in purulent discharges, providing the reaction is acid. If the material becomes alkaline, the flagellates disappear, and alkaline vaginal injections will cause their disappearance.

Greeenhill thinks that the clinical picture presented in trichomonas vaginalis vaginitis is rather uniform and striking. Patients complain of profuse discharge which, in about half the cases, is associated with a burning or itching sensation in the vagina and on the vulva. Occasionally irritation is so severe that sleep is disturbed. Patients often scratch the external genitalia, resulting in an inflammatory reaction similar to intertrigo. The discharge often has a disagreeable and penetrating odor.

On external examination small condylomas, either flat or pointed, may occasionally be seen, and the introitus is usually reddened. The entire vaginal mucosa is found to be reddened, sometimes fiery red, usually diffuse in the introitus, but may be either diffuse or patchy in the vagina. Often the vagina has a deep orange color, and usually presents the appearance of an inflammatory condition; hence this clinical picture is called trichomonas vaginalis vaginitis. The region of the external os is also usually red and bleeds easily, even though there is no erosion.

There is no inflammatory condition found above the external os. The vagina contains a very large amount of greenish-yellow foamy purulent discharge which looks like that of gonorrhea, although occasionally the discharge is thin and watery. Most of this secretion is found in the vaginal vault, and it may have an acid, alkaline or amphoteric reaction.

This statement is in contrast to that of Craig who says the organism lives only in an acid medium. The organism may be demonstrated easily by means of a hanging drop of the secretion diluted with normal saline.

## TREATMENT

Theoretically one should be able to destroy all the trichomonas in one thorough treatment of the vagina. This is not possible, however, and Davis thinks it probable that some of the parasites may be harbored under parts of the inflamed mucous membrane or elsewhere in the genital tract. He says, "I have frequently suspected the cervical canal, but thus far it has not been possible to prove that it is responsible for the frequent reappearance of the flagellates after a menstrual period. In obstinate cases I am now using a long thin cautery blade in the cervical canal. It is too early to report results."

No one type of treatment, according to Davis, is certain to cure in every case. It is important that drugs irritating to the vaginal mucosa be avoided. Treatment should be given at least four times a week, and continued until the vaginal mucosa has healed, and the leukocytes and parasites have disappeared. Daily treatments are occasionally advisable. The detail of Davis' treatment is as follows:

1. A speculum of proper size is inserted and the vagina dried with cotton, cleansed with 1 per cent lysol solution and again dried.
2. Entire vaginal mucosa is painted with 5 per cent mercurochrome.
3. Glycerine or icthyol (5 per cent) in glycerine and a tampon is inserted.
4. When a douche is advised, either 1 per cent lactic acid or lysol may be used. It would appear that lactic acid has its chief value after the vaginitis has entirely disappeared.
5. A drying powder is at times effective. Kaolin is hard to remove from the vagina and appears to have no advantage over an alkaline mixture, such as Bi-So-Dol.

Greenhill scrubs the vagina with green soap, washes the soap away with water, dries the vagina, and applies tampons saturated with glycerine and a weak solution of methylene blue. Green soap and glycerine destroy the organisms very quickly, as Davis found experimentally. Greenhill has used phenol and lysol douches as suggested by Hegner, but does not believe them any more efficient than the lactic acid solution advised and used by Davis. Greenhill discontinues office treatment after two consecutive negative slides, but advises continued use of lactic acid douches. Davis advises the cleansing of the external genitalia and the anus with liquid soap and water night and morning during treatment, before coitus and after defecation for an indefinite period, in case of an associated intestinal infection. It is also advisable to examine the vaginal secretion at the end of the menstrual period for several months.

In the last three months in private practice I have found and treated twelve cases of trichomonas vaginalis vaginitis. At first I used green soap for scrubbing the vagina, and the methylene blue solution on tampons, recommended by Greenhill in his paper of December, 1928. Later, however, I used glycerine tampons and merely painted the vaginal walls with the methylene blue solution. Upon testing hexylresorcinol in my laboratory, I found that the motility of the organism was immediately stopped when a drop of it was mixed with a drop of a solution containing active trichomonas vaginalis.

The treatment now used and recommended is as follows: The vulva, vagina and cervix are thoroughly scrubbed with green soap. After this is washed out with water, the tissues are carefully dried with a hot-air blower and painted with hexylresorcinol. Then a tampon saturated with glycerine is placed high in the vagina and a dry tampon is inserted after it. The patient is then instructed to remove the tampons on the next morning and to take a douche of 3 per cent lactic acid. This douche is repeated on the two following mornings and another treatment is given on the third day. After three such treatments I have found no trichomonas and no discharge. The patient is advised as to thorough cleansing of the anus and vulva and asked to return, if there is a recurrence of the discharge.

Is this organism pathogenic? There has been doubt in the minds of some writers. Experience with the above-mentioned twelve cases has convinced me that there is a definite relationship between the presence of the trichomonas and a certain type of discharge. Notwithstanding this opinion, further studies will be made with the idea of determining how many women harbor trichomonas in the vagina without symptoms, and also with the idea of determining whether they will affect a healthy vaginal mucosa, or whether they locate only on a vaginal mucosa that is already diseased. Further studies will also be made in an attempt to locate the source of the organism, and particulaly to determine whether the recurrences are from the rectum or from the bladder.

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545 Medical Arts Building.

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# MANAGEMENT OF GONOCOCCAL PELVIC INFECTION*

### AN ANALYSIS BASED ON THE STUDY OF ONE HUNDRED OPERATIVE CASES AND ONE HUNDRED SIXTY-SEVEN SEDIMENTATION READINGS

Martin S. Sichel, M.D.
PORTLAND, ORE.

The gonococcus is the etiologic factor in 60 to 88 per cent of all pelvic infections. The incidence of postpartum and postabortal streptococcic infection varies from 15 to 20 per cent, while that of tuberculosis infection is from 2 to 10 per cent.

Cherry[1], reviewing 1105 cases at the Harlem Hospital, found the gonococcus to be the exciting cause in 88 per cent of all pelvic infections. The diagnosis was based on one of three points: (1) the finding of positive smears (12 per cent in the series), (2) the presence of a urethritis or endocervicitis with negative smears with or without an infection of Skene's or Bartholin's glands, and, (3) the presence of bilateral tubal infection along with evidence of infection of the lower genital tract. Schmitz[2], in reviewing a large series of cases at the Cook County and Mercy Hospitals, found the incidence of the gonococcus to be 75 per cent. Black[3] found the Neisser organism as the causative agent in 80 per cent; C. J. Miller[4] in 70 to 75 per cent; and Curtis[5] in 70 to 80 per cent.

Norris[6] reports 7.7 per cent of all tubal infections as caused by the tubercle bacillus. Smith[7] reviewed 63 cases at the Boston Free Hospital for Women, occurring in the thirty-year period from 1896 to 1927. He found the incidence of tuberculous tubal infection to be only 2.2 per cent; Schmitz[2] and Curtis[5] independently report 5 per cent; while Hurden[8], from the Johns Hopkins Hospital records, reports 10 per cent occurring in 1000 cases of pelvic infection.

*Classification.* The following types of gonorrheal salpingo-oophoritis are to be considered from the standpoint of therapy (Polak[9]).

1. Acute and subacute primary salpingo-oophoritis. Those cases undergoing their first attack.

2. Acute and subacute exacerbations of a chronic salpingo-oophoritis. Those cases that continue to break out in fresh and repeated attacks, following a flare-up from a focus of infection or following a new infection.

3. Chronic Salpingo-oophoritis. Afebrile cases with palpable adnexal masses and the symptom complex of chronic pelvic infection, namely, abdominopelvic pain, menorrhagia or metorrhagia, dysmenorrhea, leukorrhea, dyspareunia, backache, weakness, loss of weight and inability to work.

*Management of the acute case.* The treatment of the acute case, the subacute and the acute exacerbation should always be expectant. Operation when necessary is reserved for the sequelae of pelvic infection and should be undertaken only during the quiescent stage; during this time the mortality rate is relatively low. Operation during the acute stage entails a high mortality.

Simpson[10], in 1909, was the first to come forward with a complete change of ideas in the treatment of pelvic inflammation. He showed that operation was not always necessary for the complete restoration of health, comfort and functional activity, and that operation during the acute stage may entail a grave danger.

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* Read at a meeting of Portland City and County Medical Society, Portland, Ore., Oct. 16, 1929.

Miller[4] found that autosterilization occurs in gonococcal salpingitis under expectant treatment, resulting in a spontaneous cure in the majority of cases. The gonococcus is an aerobic organism; once it becomes encapsulated in the tubes death is inevitable and activity ceases. Holtz[11] reports 1,083 cases from the Scandinavian Clinic with their excellent follow-up system. These cases were given only expectant treatment; 82 per cent showed complete cures; in 12 per cent subsequent pregnancies ensued. Curtis[12,13,14] reports 85 per cent of acute pelvic infections of a gonorrheal type recover under expectant treatment. In a complete analysis of three hundred tubes removed at operation it was impossible to find the gonococcus in the tubes of those patients free of temperature and with normal leukocyte counts for a period of ten days to three weeks prior to operation. Whitehouse[15] reports 80 per cent recover and remain in good health under expectant treatment alone.

TABLE I.

Comparative Operative Mortality Rates Following Laparotomy for Pelvic Infection

| Author | Classification | Cases | Mortality Per Cent |
|---|---|---|---|
| Ricci[16] | Chronic nonpurulent | 1250 | 1.0 |
| | Acute and chronic purulent | 250 | 14.0 |
| Cherry[1] | Chronic (under 16,000 w.b.c.) | 508 | 4.1 |
| | Acute (over 16,000 w.b.c.) | 120 | 16.6 |
| Woolston[17] | Chronic quiescent | 1000 | 2.5 |
| Black[18] | Chronic quiescent | 650 | 2.0 |
| Simpson[10] | Chronic quiescent | 456 | 0.7 |
| Holtz[11] | Chronic quiescent | 400 | 0.5 |
| Bell[19] | Chronic quiescent | 127 | 2.3 |

The following expectant regime is recommended for the treatment of the acute case: (1) Complete rest in bed, (2) the semi-Fowler position, (3) icebags continuously applied to the lower abdomen, (4) fluids, three quarts daily, (5) liquid diet, (6) mineral oil, one-half ounce twice daily; no cathartics, (7) low enema of water and glycerine, three ounces of each given every second day, (8) sedatives: morphine, codein, aspirin, allonal, bromides.

With the subsidence of the temperature and acute symptoms, hot abdominal stupes are used; hot water or soda douches twice daily to promote absorption; and the diet gradually increased. Bed rest is continued from a week to ten days after the temperature has dropped to the normal level. Following recovery from the acute attack the focus of infection in the lower genital tract should be systematically treated.

*Foreign protein.* During the acute stage intramuscular injections of foreign protein in the form of sterile milk, as advocated by Peterson,[20] Gellhorn,[21] Graves,[22] Watkins[23] and others may be given. The initial injection of 5 c.c. is given deep into the buttocks. Ten c.c. is then injected on alternate days until four to six doses have been given. Pain is greatly relieved and a reaction characterized by a rise in temperature and a leukocytosis of from 16,000 to 25,000 occurs within eight to twenty-four hours.

Hibbert[24] reports a series of 152 cases treated with six to twelve injections of aolan. He found 82 per cent were relieved of pain, and 46 per cent of pain and palpable tubal masses.

*Surgery in acute stage.* Surgery during the acute stage of a salpingo-oophoritis is indicated for the drainage of a Bartholin abscess. The rare cases of rupture of a pyosalpinx become a surgical emergency necessitating laparotomy.

*Management of chronic cases.* In considering the chronic cases, treatment may be divided into medical and surgical. The medical treatment consists of rest, diathermy, and the treatment of the cervix, urethra, Skene's and Bartholin's glands.

*Diathermy.* Diathermy introduced independently by Corbus and O'Connor[25, 26] and Cherry[27, 28] is of definite therapeutic value. Diathermy is the application to the body of an electric high frequency current that causes an increase in the pelvic circulation through the generation of local heat. By the abdominovaginal method the active electrode is placed in the vagina and the inactive over the pubis or in the form of a belt surrounding the abdomen.

A milliamperage of from 1700 to 2000 is soon reached, producing a temperature of from 112° to 115° F. in the vagina. Treatment is continued for forty minutes and repeated every four days. It is of value in the reduction of pelvic masses, relief of abdominopelvic pain and in curing or diminishing an endocervicitis. Scheffey and Schmidt[29] recently recommended the giving of diathermy by the abdominosacral method. They found it to be a helpful adjunct in the treatment of pelvic infections.

*Linear cauterization of cervix.* The treatment of the cervix consists in the eradication of all infected glands lining the cervical canal from the internal to the external os, and the curing of all erosions and inflamed surfaces on the vaginal portion of the cervix. This is done by linear cauterization first introduced by Hunner[30] in 1906 with the paquelin cautery and Dickinson[31, 32] in 1921, who improved the technic by use of the nasal-tip cautery.

Later Mathews,[33] Holden,[34] Behney,[35] Martzloff,[36] Davis,[37] Adams[38] and many others in this country reported good results following this technic. By this method linear cauterization of the cervix is undertaken, striping the cervix radially on first the posterior and then the anterior lip to a depth of from two to five millimeters and from one-half to one centimeter distance from each other. This should be repeated two to three times at two to four week intervals, allowing the raw areas to heal before each subsequent treatment. In cases of deep seated infection of the cervical glands it is necessary to place high linear stripes within the cervical canal, reaching from the internal to the external os. This is best done under gas anesthesia and after a moderate degree of dilatation of the cervix.

The after-treatment is important. The patient should be warned that there will be a very profuse discharge from four to seven days following the cautery treatment. For the discharge an alkaline douche twice daily is recommended.

The results obtained in the cure of chronic endocervicitis by cautery methods are fairly satisfactory. Fulkerson,[39] using the cautery treatment on 591 patients, obtained cures in 65.3 per cent and improvement in 21.1 per cent. Mathews[33] in 200 cauterizations obtained cures in 80 per cent and improvement in 20 per cent.

Before cauterizing erosions of the cervix examine carefully for syphilis. MacDonald[40] found nine out of ninety-one erosions of the cervix to be of syphilitic origin by dark field examination. The Wassermann was positive in only four of these cases. All moist lesions of the cervix or genitalia should be considered potentially as syphilitic and dark field examination made.

Skene's glands when chronically enlarged and infected should be probed and their tracts cauterized. Bartholin glands when cystic or moderately enlarged should be entirely removed surgically.

*Sedimentation time.* The sedimentation time, as introduced by Linzenmeier[41] in Europe in 1920 and soon after by Friedlander,[42] Baer and Reis,[43] and Polak and Mazzola[44] in this country, furnishes one of the most valuable means of estimating the safe time to operate. Excluding pregnancy the velocity of the sedimentation time is directly proportional to the extent or severity of the pelvic infection or both. Benischek and Douglas[45] found the sedimentation time in normal pregnancy to vary from 128 minutes at two months to 11 minutes at eight months gestation. The normal variation is from 250 to 600 minutes. Laparotomies for pelvic infection should not be performed when the reading is under 120 minutes.

The sedimentation readings with the associated temperatures and leukocyte counts as taken on 167 gynecologic cases at the Minneapolis General Hospital during the six month period, January to July, 1928, are shown in the following table:

TABLE II.

| Cases | Diagnosis | Temperature | Average Sedimentation Time | Leukocyte Count |
|---|---|---|---|---|
| 20 | Acute gonorrheal salpingitis | 102.4 | 42 | 15,300 |
| 24 | Chronic gonorrheal salpingitis* | 98.0 | 222 | 9,760 |
| 9 | Acute postpartum pelvic cellulitis | 103.5 | 23 | 13,500 |
| 18 | Septic abortion | 102.1 | 33 | 18,100 |
| 49 | Nonseptic abortion | 99.0 | 82 | 11,400 |
| 4 | Squamous cell carcinoma of cervix | 98.0 | 29 | 11,100 |
| 7 | Bartholin abscess* | 99.4 | 73 | 14,600 |
| 2 | Ruptured ectopic pregnancy* | 98.0 | 216 | 7,250 |
| 1 | Torsion pedicle ovarian cyst* | 101.0 | 242 | 11,180 |
| 4 | Chronic appendicitis* | 98.0 | 220 | 8,000 |
| 10 | Retroversion of uterus, 3* | 98.0 | 209 | 6,600 |
| 8 | Relaxed pelvic floor* | 98.0 | 238 | 7,600 |
| 6 | Erosion of cervix† | 98.0 | 309 | 8,200 |
| 5 | Chronic endocervicitis† | 98.0 | 338 | 7,100 |

* Operation performed. † Cautery treatment.

*Uterosalpingography.* The use of lipiodol, a form of iodized oil, since 1925, as a means of visualization of the uterine cavity and tubes, has furnished a more exact means of gynecologic and preoperative diagnosis. The patency or nonpatency, the presence of acute or chronic infection or the presence of normal tubes can be definitely diagnosed. By this method a hydrosalpinx may be outlined before operation.

In the past few years many authors have written extensively on this subject. Jarcho[46, 47] in this country and Beclere[48] in France have both published important papers. Mathieu[49] uses lipiodol as an aid in the diagnosis of sterility of tubal origin. In questionable cases of tubal infection he uses this method as a further means of helping to decide between medical and surgical treatment. If the cornual extremities of the tubes are both closed, a salpingectomy is indicated. If the cornual ends are open and the distal ends closed, gas insufflation may successfully open the tubes. Finally, if both tubal extremities are open medical treatment should be resorted to.[50]

*Operation.* There are three types of operation to consider for the relief of the sequelae of chronic salpingitis:

1. The conservative type, bilateral salpingectomy with oophorectomy or resection of the ovaries if necessary.
2. The radical type, bilateral adnexal removal with complete hysterectomy.
3. The intermediate group, the Bell Beuttner type of operation, consisting of a fundectomy, with bilateral salpingo-oophorectomy and ovarian transplantation.

If possible one ovary should be retained. It is better to do oophorectomy than resection on one ovary if badly infected. Resection predisposes to subsequent enlarged cystic ovaries and secondary operations. Ovarian grafting may be done to maintain the ovarian function. This may be done after the method advocated by Bell,[51] in which the graft is placed in a vascular area in the rectus muscle. In 118 cases so treated, he obtained functional results in 83 per cent. By the method of Estes[52] a portion of the ovary is implanted into the uterine horn and covered with the round ligament. He followed 45 cases so operated on, and found that 41 of these menstruated. Four cases, however, necessitated secondary operations for cystic enlargement of the ovaries. Pavlik[53] reports 16 cases by similar method. All regained their menstrual function within three weeks to three months following operation, with a resulting gratifying effect on the psychic effects of the women.

One hundred consecutive pelvic laparotomies* for chronic postgonorrheal salpingo-oophoritis, taken from the gynecologic service of the Minneapolis General Hospital, have been carefully analyzed. All of these cases were personally observed during their entire stay in the hospital. The basis for concluding that each case included in this group analyzed was of gonorrheal origin follows Cherry's rules. Positive smears were obtained in eight cases.

The age incidence was relatively low. The youngest in the series was seventeen years and the oldest forty. The average age was 23.8 years. Ninety-six cases were of the white and four of the negro race.

This series were all operated on during the quiescent stage. The average leukocyte count before operation was 8,910, the highest being 14,600 and the lowest 4,800. The average polymorphonuclear count was 65.8 per cent, the highest being 82 and the lowest 43 per cent. Eleven cases had previous laparotomies for a similar condition before coming to operation.

The following types of operations were performed:

TABLE III.

| *Type of Operation* | *Cases* | *Total* |
|---|---|---|
| Bilateral salpingectomy | 28 | |
| Bilateral with unilateral oophorectomy | 31 | |
| Bilateral with bilateral oophorectomy | 3 | |
| Bilateral with unilateral ovarian resection | 11 | |
| Bilateral with bilateral ovarian resection | 12 | |
| Bilateral with fundectomy | 1 | |
| Bilateral with supravaginal hysterectomy | 2 | 88 |
| Unilateral salpingectomy | 3 | |
| Unilateral with unilateral oophorectomy | 4 | |
| Unilateral with unilateral ovarian resection | 3 | 10 |
| Unilateral oophorectomy | 2 | 2 |

In addition to the removal of the pelvic structures appendectomy was performed sixty-four times and suspension of the uterus for third degree retroversion flexion by plication of the round ligaments twenty-three times.

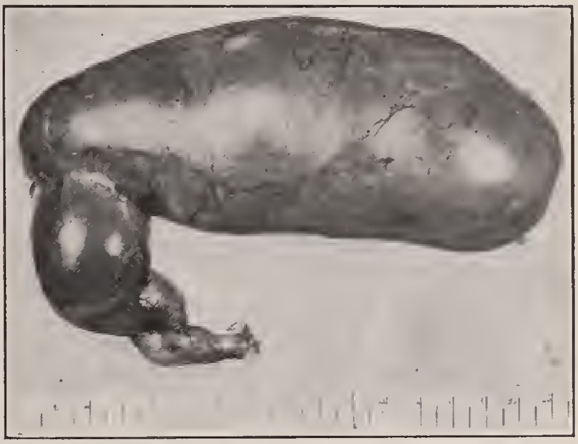

Fig. 1. A giant hydrosalphinx, measuring 6 by 7 by 16 cm. and containing 340 c.c. of clear straw colored fluid removed intact at operation.

The type of pathology encountered in this series was as follows:

TABLE IV.

| *Type of Pathology* | | *Cases* |
|---|---|---|
| Nonsuppurative salpingitis | | 31 |
| Bilateral | 26 | |
| Unilateral | 3 | |
| With extrauterine pregnancy | 2 | |
| Suppurative salpingitis and pyosalpinx | | 50 |
| Bilateral | 48 | |
| Unilateral | 2 | |
| Hydrosalpinx | | 11 |
| Bilateral | 6 | |
| Unilateral | 5 | |
| Ovarian abscess, unilateral | | 2 |
| Tuboovarian abscess | | 4 |
| Chronic interstitial salpingitis | | 1 |
| Ovarian cyst | | 1 |

There was one death in the series, a mortality of one per cent, occurring on the fifth day postoperative from streptococcic peritonitis. A bilateral salpingectomy, resection of both ovaries and appendectomy were done. The postoperative course was stormy with a high temperature and pulse rate, abdominal distension and tenderness, and a paralytic ileus. There was no response to treatment. Necropsy revealed a typical purulent streptococcic peritonitis.

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* Seventy cases are taken from the service of Dr. A. E. Benjamin and thirty from the service of Dr. F. L. Adair.

The morbidity was relatively low, as evidenced by the days in bed postoperative. There was wound infection in only five cases, two of which were severe.

TABLE V.

| *No. of Days Postoperative* | *Cases* |
|---|---|
| 14 | 66 |
| 15 to 21 | 24 |
| 22 to 28 | 7 |
| 29 to 35 | 1 |
| 36 to 50 | 2 |

Abdominal drainage is unnecessary when pus is encountered by the rupture of a pyosalpinx during operation. This type of exudate is sterile. No free peritoneal exudate was encountered in this series. A small rubber tissue drain was placed in the abdominal wound above the fascial layer for forty-eight hours in those cases in which a pyosalpinx was ruptured. The peritoneum is able to take care of sterile pus but the fat of the abdominal wall often times is not.

## SUMMARY

1. The gonococcus is responsible for 60 to 88 per cent of all pelvic infections.

2. The acute and subacute cases of gonococcal salpingo-oophoritis and the acute exacerbations will recover under the proper regime of expectant treatment.

3. The mortality of the acute cases when treated expectantly is practically nil.

4. Following the subsidence of the acute inflammation, it is of paramount importance to treat the foci of infection, namely, the urethra, Skene's and Bartholin's glands, and the cervix.

5. Diathermy and foreign protein injections both have a place of variable importance in the treatment of pelvic infection.

6. Linear cauterization is the treatment of choice for chronic endocervicitis.

7. The sedimentation time is of value, when used as an aid in determining the safe time to operate and in diagnosis.

8. Lipiodol injection of the uterus and tubes should be resorted to before performing operations on questionable cases of chronic salpingitis, if pregnancy is desired.

9. Abdominal operation is reserved for a small percentage of cases suffering from the sequelae of salpingitis.

10. The type of operation shall be determined by the amount of damage already sustained by the uterus and adnexa.

11. Abdominal drainage is unnecessary, when operation is undertaken during the quiescent stage.

12. One hundred analyzed operative cases and one hundred and sixty-seven sedimentation readings are presented.

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New and Essential Point in Blocking of Internal Laryngeal Nerve. Lawrence Schlenker, St. Louis (*Journal A. M. A.*, Dec. 14, 1929), says that the essential point in successful blocking of the laryngeal nerve is the bringing of the solution into intimate contact with the nerve, to accomplish which the fluid must be deposited in the exact plane of tissue in which the nerve lies. By piercing the thyrohyoid membrane, this objective is most certainly attained and a relief secured which is immediate and complete, or practically complete.

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# COMBINED INTRAARTICULAR AND EXTRAARTICULAR FUSION OF THE TUBERCULOUS HIP *

C. F. Eikenbary, M.D., F.A.C.S.
and
John F. Le Cocq, M.D.
SEATTLE, WASH.

The conservative treatment of tuberculosis of the hip, even in the hands of the most skillful, is far from satisfactory. A careful analysis of your own results or a careful perusal of reports from the various orthopedic clinics can hardly fail to convince you of this statement. A visit to the outpatient department of most any orthopedic clinic will reveal a large number of tuberculous hips that have been under active conservative treatment or observation over a period ranging from a few months to fifteen to twenty years. The only cases cured, with useful motion, are those in which the diagnosis is exceedingly questionable. And the only cured cases, wherein there can be no question as to diagnosis, are those with ankylosed hips, ankylosed naturally or by operative procedure.

Probably most of us have diagnosed tuberculosis of the hip wherein we have had excellent recoveries with normal motion. Few, if any of those, can be proven to be tuberculous. It seems quite likely that none of them are. There are many of the milder arthritides that simulate the early stages of tuberculosis of the hip. Practically all of the cases of so-called Legg-Perthes disease are, in the early stages, similar to tuberculosis. Probably there is no test other than the guinea pig test that will absolutely prove the diagnosis in the early stages.

But, judging by the behavior of the cases later on proven to be tuberculosis and treated by the best conservative treatment possible, we are forced to look askance at the cases that recover with useful motion. If there are any that so recover, it is our belief the number is so trivial that from the standpoint of standard routine treatment they may be disregarded. We have, therefore, adopted the plan of routinely subjecting all cases, wherein the diagnosis cannot be questioned, to a routine operation.

We have now reported on twenty-one cases. This number is not large enough to be conclusive or has enough time elapsed to speak definitely as to the result in all of the cases. Therefore, this must be considered as a preliminary report.

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* Read before the Fortieth Annual Meeting of Washington State Medical Association, Yakima, Wash., Aug. 29-31, 1929.

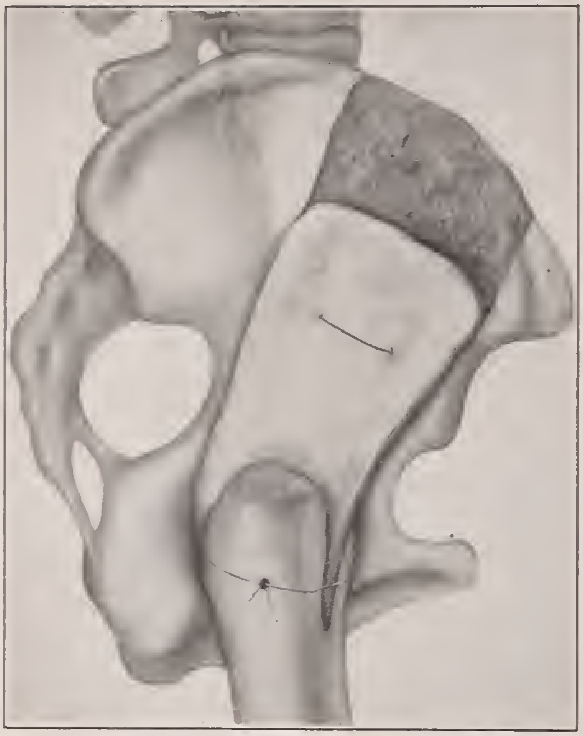


Fig. 1. Method of obtaining graft. Its fixation into the trochanter and along the lateral side of the ilium.

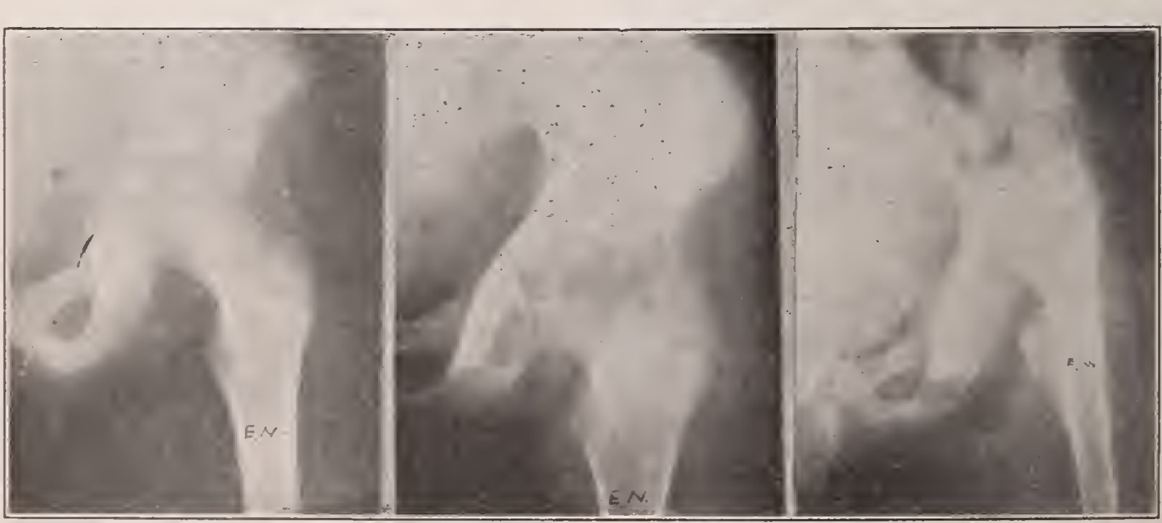
So far as we can ascertain all efforts up to the present have been confined to extraarticular procedures. It seemed to us that this method was inadequate in that it left such a very large quantity of tuberculous material in the remnant of the joint cavity. In every case which we have fused the amount of tuberculous material in the joint space was so great that a cure, even with an extraarticular fusion, was highly improbable. We have, therefore, adopted the combined intraarticular and extrarticular method.

The first four cases submitted to fusion were done by the intraarticular method only. This consisted in removing the necrotic material in the head and acetabulum, getting down as far as possible to healthy bone, and then breaking down bone chips from the neighborhood of the acetabulum and from the side of the ilium, and packing the same around and within the joint space. Three of the four cases treated this way failed to fuse, and were later operated on by the combined intraarticular and extraarticular method. One case was successful and this joint is considered cured.

### TECHNIC OF THE OPERATION

A rather extensive Smith-Peterson incision. The joint opened widely and the head turned outward. All necrotic material, debris, abscesses, etc., very radically removed. Small bony masses are then packed around the joint line. By means of a chisel the femur is split longitudinally, starting at the inner side of the trochanter and going down a distance of approximately two inches. A very large graft is then cut from the side of the ilium, starting at the crest and going downward toward the acetabulum, the graft being about four inches in length. This graft is then forced downward into the split bone just to the inner side of the trochanter. It will now be found that the upper half or two-thirds of the graft can be fitted snugly along the remnant of the neck, the acetabulum, and the side of the denuded ilium (fig. 1).

The iliopsoas muscle is then reflected from the inner side of the ilium, far enough down so that the side of the ilium and the graft may be drilled and heavy sutures placed. These sutures are carried through the ilium by means of ordinary soft wire.



a b c

Fig. 2. Duration two years. a. Appearance of hip on admission. b. One year later, showing marked destruction in spite of conservative treatment. c. Four months after fusion which is definitely occurring. Sinuses healing. General health markedly improved.

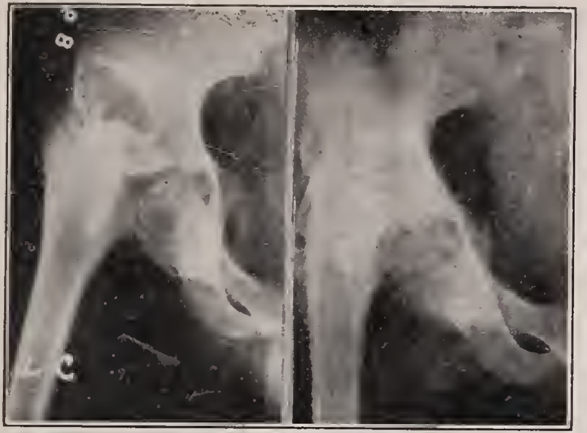


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Fig. 3. a. Four years duration. Painful, draining sinuses. b. Eight months after fusion. Solid, painless. Sinuses all healed.

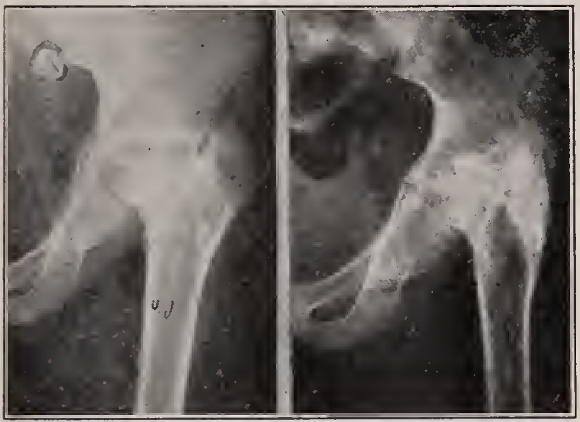

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Fig. 4. a. Five years duration. Active, painful. b. Six months after fusion. Solid and painless, cured.

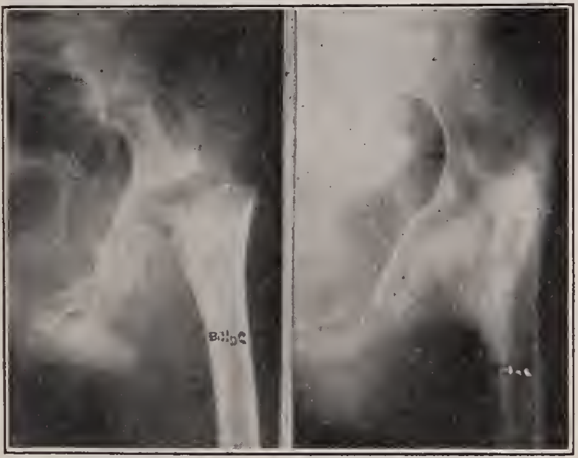

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Fig. 5. a. Eight years duration. Painful and progressive. b. Six months after fusion. Solid and painless.

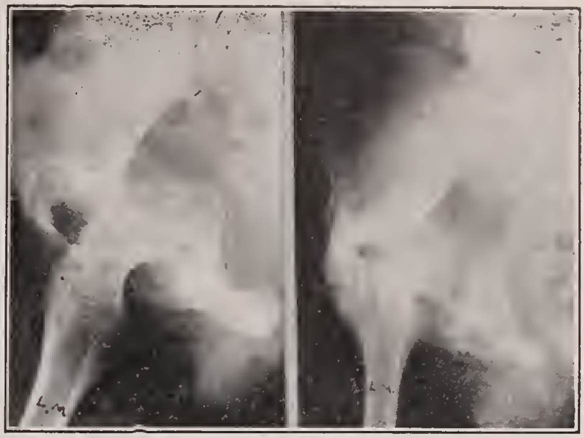

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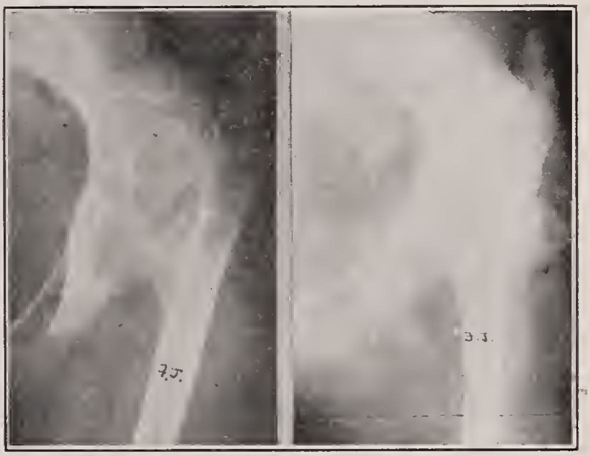
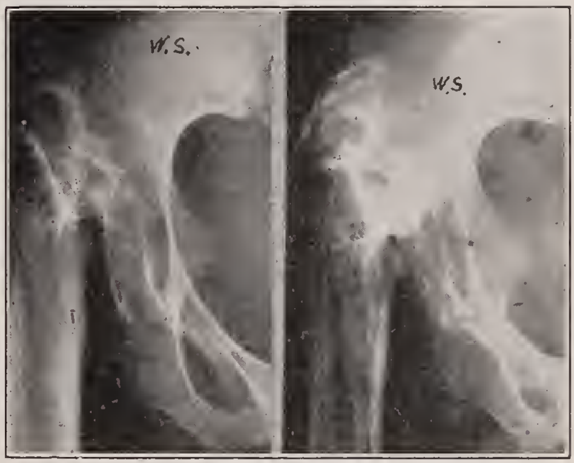
Fig. 6. a. Eight years duration. Active and painful. b. Six months after fusion. Solid and painless.



a b
Fig. 7. a. Nine years duration. Painful and progressive. b. Five months after fusion. Solid and painless.



a b
Fig. 8. a. Eighteen years duration. Painful. b. One year after fusion. Hip is solid, cured.

The suture used is either kangaroo tendon or forty-day chromic. The wound is then closed in the usual way.

The child is put up in a very long spica from the axilla down to and including the foot on one side and down to the knee on the other. The cast remains on for about three months, when it is removed for inspection and radiographs. At the end of four or five months weight-bearing in the plaster is allowed. From six to twelve months are required to effect a cure.

REPORTED CASES

| | |
|---|---|
| Number of cases operated on (youngest 4, oldest 21) | 21 |
| Sinuses at the time of operation (both cases are fusing and both show marked general improvement but are not yet cured) | 2 |
| Sinuses developing where none existed before | 0 |
| Cases dismissed as cured | 5 |
| Probably cured, but still wearing casts for support or safety | 4 |
| Still in supports | 10 |

In the twenty-six cases, the average age of duration of the disease was 4½ years; longest period was 19 years, and shortest period 6 months. All had been given good conservative treatment.

SUMMARY

1. It is our opinion that all proven tuberculous hips should be fused, using the combined intraarticular and extraarticular method.

2. Sinuses are not necessarily a contraindication to operation.

3. Deep-seated abscesses do not constitute a contraindication, and should not have postoperative drainage.

4. From six to twelve months are required for a cure.

5. Many of our cases had been given the best conservative treatment for years and were still progressing.

6. Eighty per cent of cases, in which guinea pig inoculations were made, were positive for tuberculosis.

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# THE ANTIRACHITIC ACTION OF ACTIVATED ERGOSTEROL*

## A CLINICAL STUDY OF 133 CASES

C. Ulysses Moore, M.D., F.A.C.P.,
H. G. Dennis, M.D.
and
B. I. Phillips, M.D.
PORTLAND, ORE.

In the history of rickets four dates mark milestones of progress: 1650, when Glisson[1] of England wrote his masterly monograph describing the disease; 1800 to 1830, when physicians in Holland, Germany (Schutze and Schenk)[2], and France (Brettoneau)[3] showed that cod liver oil has rickets-curing properties; 1918, when Mellanby[4] of England discovered that a deficiency of a fat-soluble vitamin is an etiologic factor; and 1928, when A. F. Hess[5,6] of New York and A. Windaus[7,8] of Göttingen, Germany, together proved that the antirachitic vitamin is produced by the irradiation of activatable ergosterol. For this final valuable contribution to rachitic humanity, Windaus last year received the Nobel prize and Hess the honor of academic priority.

Ergosterol,** or ergot-sterol, has been known since its discovery by the French scientist Tanret[9] in 1889. His colleague Gerard[10] found it in several fungi, including yeast. Tanret later (1908) devised a means of obtaining it in a pure form. It remained, however, of academic interest only, until its relation to vitamin D was proved.

Ergosterol occurs in all animal organisms and by the ultraviolet irradiation of the living animal vitamin D may be produced. In this way the animal synthesizes its own vitamin. The cod probably possesses this power to an unusual degree for cod liver oil contains ergosterol to the extent of 1/10 per cent of the total sterol present. It has now been definitely shown (Pfannensteil)[11] that lipoid-containing foods, such as animal fats, vegetable oils, eggs, milk, cereals, brain, liver and spleen, acquire antirachitic properties as the result of exposure to the short ultraviolet rays (275-300 millimicrons). The reason for this is, of course, that these foods, and probably others contain ergosterol, on being irradiated produce vitamin D.

The pioneer work on the irradiation of food products in this country was done by Steenbock in 1924. He was able to obtain a basic patent (U. S. 1,680,818) in the name of the Wisconsin Alumni Research Foundation. This patent prevents the injudicious exploitation in America of irradiated food products.

The chief sources of ergosterol are ergot, mushrooms and yeast. Yeast is the most practical of these commercially but the amount and potency of the ergosterol obtained varies greatly with the conditions under which the yeast is cultivated. The product of the greatest purity and potency so far reported is an activated ergosterol more than 100,000 times as effective as cod liver oil, which has been developed through a special technic by Bills[12] of the Mead Johnson & Co. laboratory.

A solution of this substance in a vegetable oil has been marketed under the trade name of acterol. It is biologically tested so as to have an antirachitic potency 100 times that of cod liver oil. The importance of biologic standardization has been emphasized by the experience of the Europeans, whose products are of variable potency. Bills applied the Shipley line test to five European products which had been made up by weight and chemically and photometrically tested, and obtained the following biologic potencies for them: 14, 40, 150, 800 and 2,500 times that of cod liver oil. Is it surprising that the foreign literature should contain contradictory reports as to the dosage, therapeutic properties and toxicity of these products? Because of these conflicting reports, it was deemed wise to withdraw acterol from the market until the proper dosage with this biologically standardized product could be accurately determined. This has now been accomplished and acterol will soon be placed on sale again.† The dosage at first recommended (3 to 6 drops daily) has been found to be too small to prevent or to cure rickets. Fortunately the toxic dose is more than 2,000 times the therapeutic dose. This product, therefore, is about as free from toxic effects as ordinary salt.

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* Read before the Fifty-fifth Annual Meeting of Oregon Medical Society, La Grande, Ore., May 16-17, 1929.

** The activated solution of ergosterol used in our tests was acterol, now marketed under the name "Mead's viosterol (originally acterol)." The terms acterol and viosterol are, therefore, identical as used in this paper.

In growing children there are three methods of determining the effect of irradiated ergosterol: first, careful physical examinations at frequent intervals; second, repeated roentgenograms of the bones; and, third, blood calcium tests, including the determination of both total and diffusible calcium. A combination of at least two of these methods is advisable. The age of the child determines in a general way the part of the body to be most carefully watched for active rickets. The most rapidly growing bones of the body are naturally the ones most involved. Therefore, during the first six months of life, the cranium; the second six months, the chest, and later in childhood the long bones and feet are the sites of the most florid rickets. The points to be noted in the head are the size and number of patent fontanelles, the softness of the suture lines and the flexibility or thickness of the bones themselves. Rachitic flexibility is present longer at the mastoid fontanelle than at any other part of the cranium.

Before visible deformity of the chest occurs there is present a palpable softening of the anterior portion of the ribs, costomalacia. Our experience covering carefully recorded cases over a period of ten years indicates that rickets of the head and chest, during the first year of life, will be followed by rickets of the extremities later. In this locality this occurs in children on diets of proper nutritive ratio, receiving daily one teaspoon of cod liver oil at three months of age and one tablespoon after six months. Many of these children were kept well tanned by natural or artificial ultraviolet light. We will grant that, if they had not received such treatment, their rickets would undoubtedly have been more marked and their general condition less robust.

A review of the records of over six thousand applicants for the Navy and Marine Corps in Portland (Anderson)[13] shows that 39 per cent of the rejections were due to rickets. This record and the failure of cod liver oil and sunshine to cure or prevent rickets in this climate makes us glad to utilize so potent an antirachitic agent as activated ergosterol and willing to do our share towards standardizing the dosage.

We have used Mead's viosterol in over 200 cases, 133 of these having been carefully followed over a sufficient period of time to warrant an opinion as to the effectiveness of the treatment. These cases have all had repeated careful physical examinations and many of them were also checked every four to six weeks by roentgenograms.

This group was composed of forty-three newborns, fifty-two older infants, thirty children, seven of whom had latent tuberculosis, and eight adults. Of the adults three were pregnant and one tuberculous. In the group of newborns, thirty-three were under daily observation by one of us (B. I. P.) at the Multnomah County Hospital. These babies seemed more vigorous than the so-called control groups, receiving no Mead's viosterol, which preceded and followed them. They nursed more avidly and, therefore, stimulated a more rapid increase in the quantity of breast milk. For this reason fifteen of them had regained their birth weight by the seventh day and twenty-nine by the tenth day. By the fourteenth day rachitic manifestations were almost entirely absent except in five who at birth had flexible areas in the cranial bones, open sagittal sutures and soft lambdoidal sutures. Because the infants receiving viosterol were so noticeably superior to the others, standard orders for newborns at the Multnomah County Hospital now include ten drops daily. Twins, triplets, premature infants and others showing abnormal osteogenesis are given twenty to thirty drops of viosterol daily or two or three drops of an activated ergosterol prepared at our request which is ten times as potent as viosterol or one thousand times cod liver oil.

Typical individual cases checked by roentgen ray and repeated physical findings will illustrate our experience to date.

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† Now marketed under the trade name Mead's viosterol (originally acterol).

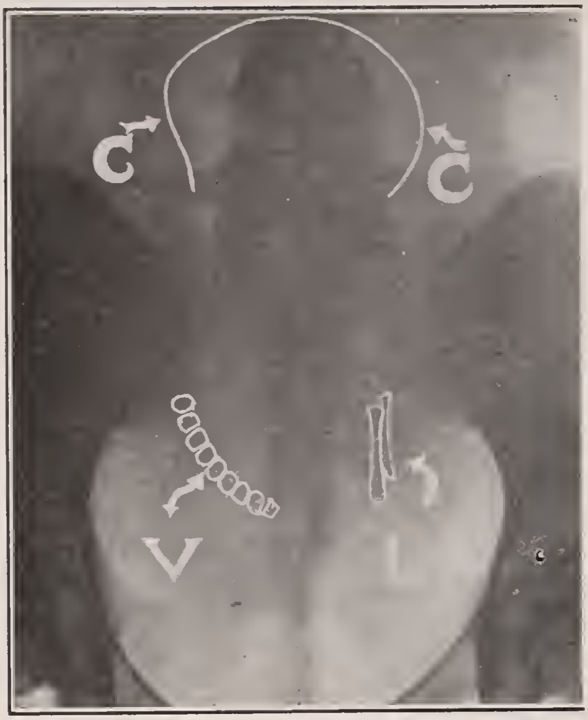

Fig. 1. Case No. 3627. Roentgenogram of fetus at fifth month of gestation with mother taking six drops of Mead's viosterol daily. C, cranial bones; V, vertebral column; L. B. long bones.

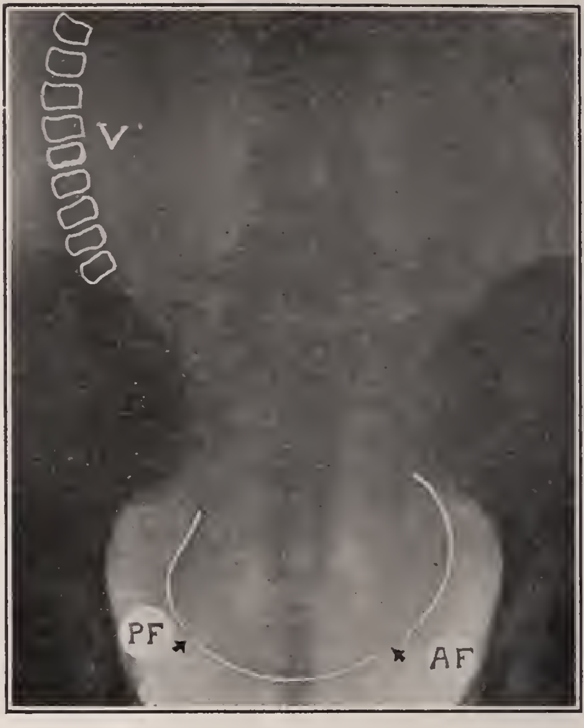

Fig. 2. Same as fig. 1 at sixth month of gestation. Spontaneous version has occurred. It is noteworthy that both anterior (A. F.) and posterior (P. F.) fontanelles are plainly outlined. V. vertical column.

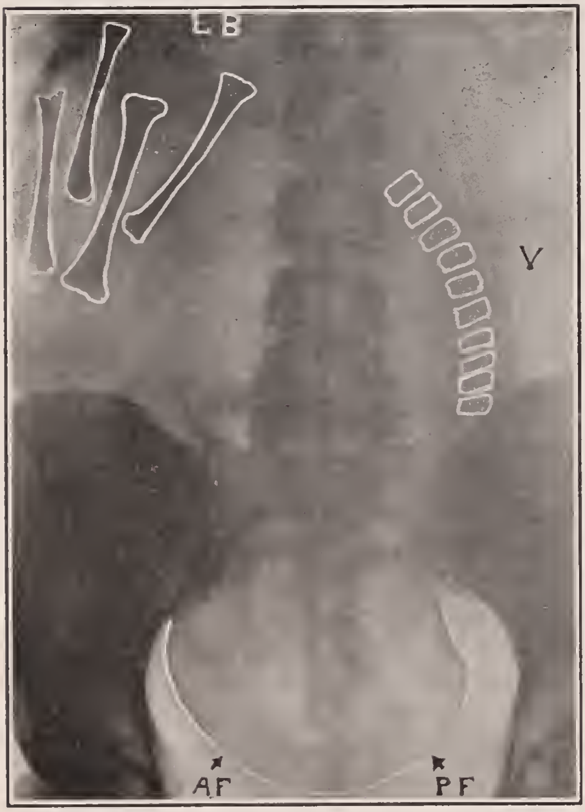

Fig. 3. Same as fig. 1 at seven months of gestation. The femora are easily visible (L. B.). A F, anterior fontanelle; P F, posterior fontanelle; V, vertebral column.

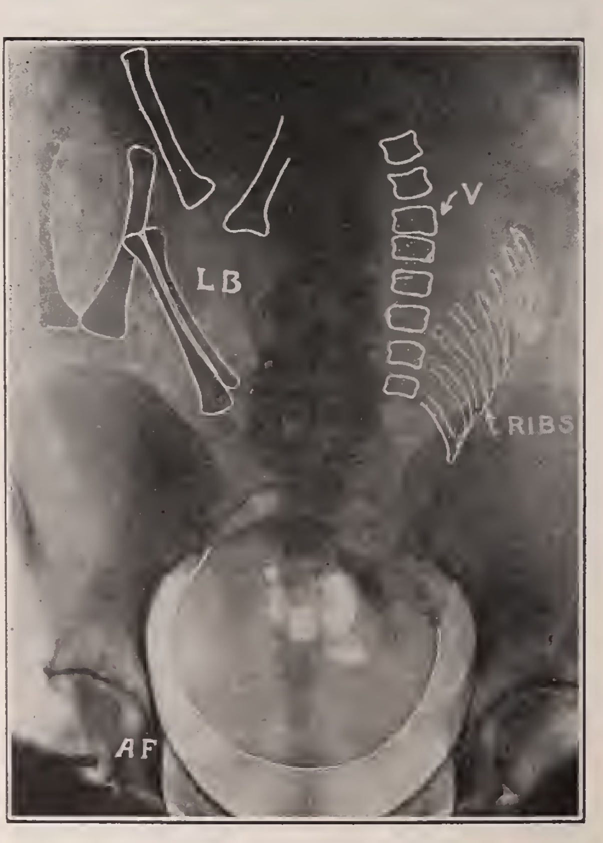

Fig. 4. Same as fig. 1 at eight months of gestation. On six drops of Mead's viosterol daily the baby's cranial bones show normal ossification. The anterior fontanelle is well demarcated( A. F.). L. B., long bones; V, vertebral column.

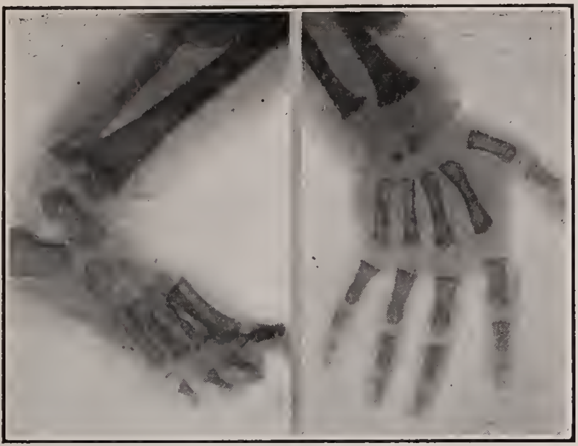

Fig. 5 Fig. 6

Fig. 5. left foot and fig. 6 right hand. Roentgenographs of No. 3627 (same as figs. 1-4) at seven months of age, showing the comparative calcification of hands and feet on eighteen drops of Mead's viosterol daily.

Case 1, a normal pregnant woman, para-I, was given six drops of viosterol daily from the third to the beginning of the ninth month of gestation. A roentgenogram taken at the fifth month shows (fig. 1) a breach presentation with the skull and vertebral column barely visible. By the sixth month (fig. 2) spontaneous version had occurred. The cranial bones show distinct ossification with both the anterior and posterior fontanelles demarcated. A plate made at the seventh month (fig. 3) is similar to that of the sixth except that the head is larger and the femora and tibiæ are visible. At the eighth month (fig. 4), in spite of the rapidly enlarging cranium, ossification appears adequate. At this time the viosterol was discontinued. The labor of nineteen hours was uneventful. Three days later the mother felt so strong she wanted to get up and dress. It required considerable persuasion to restrain her.

The baby, a girl (No. 3627), weighed seven and one-half pounds. An examination of her two hours after birth, September 2, 1928, showed a normally ossified cranium and chest. At the xyphoid plane, where most newborns are square in shape, this one was circular. There was no palpable costomalacia between the sternum and the nipple line, an exceedingly rare finding in our experience. The baby received six drops of viosterol daily from birth to six months of age. Cranial ossification progressed normally, flexibility at the mastoid fontanelle disappearing at about one month of age. No posterior flattening and no palpable bosses were present.

Ossification of the chest, however, was less favorable. At five months, a distinct anterior flattening of the chest wall had occurred and there was a costomalacia of +++. At six months examination of the chest showed costomalacia +++, rosary +, groove +. An increase of the viosterol to twelve drops daily failed to halt the rachitic process in the chest bones, the findings at the seventh month being costomalacia +++, rosary +, groove ++. Increase of the dosage to eighteen drops was sufficient to check but not to heal the process in the thoracic bones.

A roentgenogram of the wrists and ankles at this time (figs. 5 and 6) showed good ossification of the radial epiphyses, carpals and phalanges but poorer ossification of the bones of the feet. It is apparent that in this case six drops of viosterol was insufficient to prevent the development of rickets in an otherwise normal breast fed baby and that eighteen drops does not contain enough vitamin D to cure rickets in this climate.

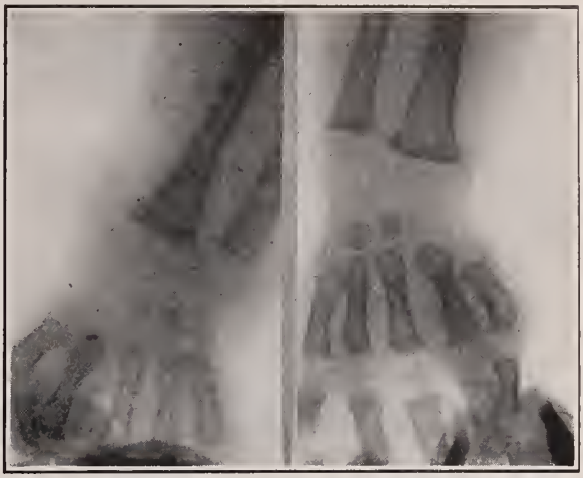

Fig. 7 Fig. 8

Fig. 7. Roentgenograph of D. C. (No. 3410) at four months of age, showing poor calcification of carpals and phalanges. From the fourth day 6 to 12 drops of Mead's viosterol had been given daily.

Fig. 8. Same as fig. 7 at six months of age. There is much better calcification of carpals and phalanges on 18 to 24 drops of viosterol.

Case 2, Baby D. C. No. 3410, was the third child of young healthy parents. The mother had received no complementary vitamin D during pregnancy, but her diet had been so balanced as to have a nutritive ratio of one protein calorie to seven of the fat and carbohydrate calories combined. It included an abundance of leafy vegetables with kale, spinach, cauliflower, asparagus, and brussels sprouts predominating. Additional vitamin B was administered in the form of six yeast tablets (Northwestern Yeast Company) daily from the beginning of pregnancy to the end of lactation, a total of eighteen months. In addition a luxor-model Hanovia mercury vapor quartz light was installed in the home and treatments were given the mother semi-weekly. Parturition was normal, there being a blood loss of less than 200 c. c. The mother regained her strength very rapidly and had an abundance of milk for her baby.

The baby was a well-developed child of seven pounds and twelve ounces. When examined on the fourth day the posterior fontanelle was normally soft, the mastoid fontanelles were one by one cm., and the anterior fontanelle five by four cm. The chest was square at the xiphoid plane and costomalacia was present.

Mead's viosterol was started when four days old and ultraviolet irradiations at three weeks. The dosage of viosterol was increased gradually from six to twenty-four drops according to the condition of the bones as indicated in the table (fig. 9). During this period of seven months the child was breast fed and was entirely free from digestive upsets or infections. Since at three months he was nearly two pounds overweight, the food (breast milk) was reduced for a time to aid in curing the craniotabes and costomalacia. This resulted in a loss of subcutaneous fat which was responsible for an apparent decrease in the circumference of the chest. As soon as the craniotabes was cured the food was increased enough to permit a normal gain. With the increase of the Harrison's grove the external rosary became nonpalpable, even though there was an increase in costomalacia.

While these changes were taking place in the head and chest bones a roentgenogram of the wrists taken at four months (fig. 7) shows poor calcification of carpals and phalanges. It required twenty-four drops of viosterol daily, subnormal gain in weight and plenty of ultraviolet irradiation to secure the excellent calcification shown in fig 8,

## EFFECT OF MEAD'S VIOSTEROL UPON ACTIVE RICKETS

| Baby D. C. No. 3410 | | | | HEAD | | | | | | CHEST | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | Viosterol | Weight | Length | Circum. | Shape | Craniotabes | Ant. Font. | Mast. Font Size | Mast. Font Flex. | Shape at Xiphoid Plane | Circ. Nipple Plane | Costomalacia | Rosary | Groove |
| Mo. | daily drops | lb:oz. | cm. | cm. | | | cm. | cm. | | | | | | |
| 0 | 6 | 7:12 | 50 | | | ± | 5x4 | 1x1 | + | square | | ± | + | 0 |
| 1 | 6 | 9: 4 | | | | ++ | 6x5 | | ++ | square | | ± | + | 0 |
| 2 | 6 | 11:12 | | | flat post. | +± | 5x5 | .5x1.5 | +± | square | | + | + | 0 |
| 3 | 12 | 13: 8 | | | " | ++ | 6x6 | .5x2 | ++ | square | | +± | + | 0 |
| 4 | 12 | 14:14 | 62 | 42 | " | ++ | 5x4 | 1x1.5 | ++ | square | 41.5 | ++ | ± | ± |
| 5 | 18 | 15: 7 | | 42 | " | ++± | 5x5 | 1x1 | +± | square | 41.5 | +++ | 0 | + |
| 6 | 24 | 15:14 | 66.5 | 43 | " | +± | 5x5 | .5x1 | + | oval | 41.5 | ++± | 0 | + |
| 7 | 24 | 16: 2 | 68 | 44 | " | ± | 4x5 | .5x.5 | ± | flat | 41.0 | ++± | 0 | +± |

Fig. 9 This table illustrates the development of rachitic manifestations in the head and chest while taking inadequate amounts of Mead's viosterol. On 6 drops daily craniotabes, mastoid fontanelle flexibility and costomalacia increased. Twelve and later 18 drops caused improvement in the cranial rickets but allowed the chest signs to become more marked. Giving 24 drops of Mead's viosterol daily produced healing in the head and checked the progress of the costomalacia and of Harrison's groove.

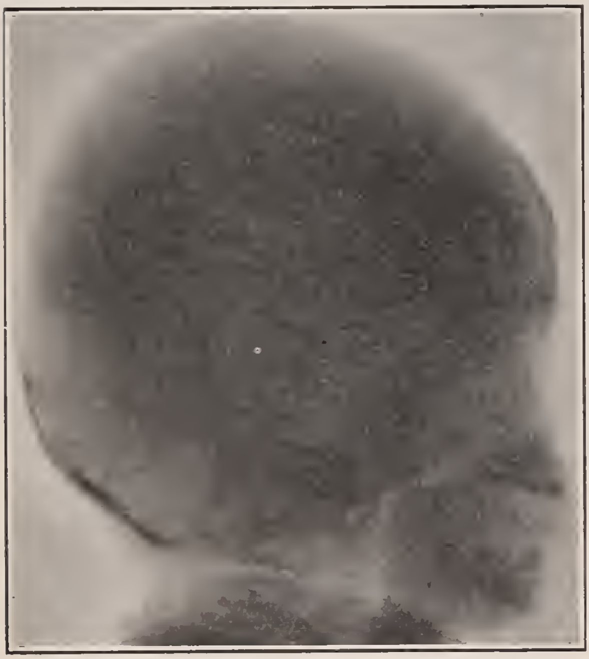

Fig. 10. Roentgenograph of B, a premature, at three months of age, showing very little calcification of parietal bones. Three drops of Mead's viosterol had been given daily for two weeks and one drop for three more weeks without demonstrable benefit. The parietals were as flexible as a rubber ball.

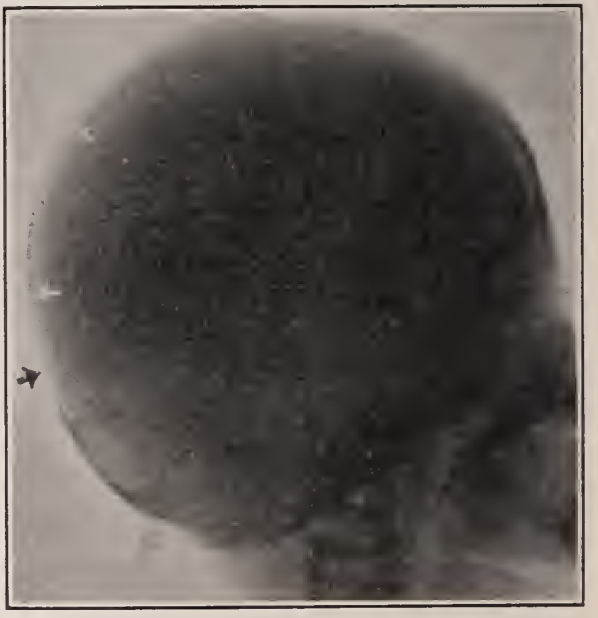

Fig. 11. Same of fig. 10 at four months of age. Nine drops of Mead's viosterol had been given daily for a month. A slight improvement in calcification of the parietal bones (white arrows) has taken place. The posterior fontanelle is now demarcated.

taken at six months. But even though evidence of rickets had disappeared in the wrists, marked craniotabes and costomalacia were still present. It required an additional two months of this intensive treatment to cause a disappearance of these rachitic manifestations.

Case 3, Baby boy B, Multnomah County Hospital, birth weight 1465 grams (3 lbs. 3 oz.), was born at six months gestation after an illegal attempt at abortion. The temperature at birth was 97.8° F. and in spite of being kept in a Hess incubator dropped to below 94° and remained there for six days. This low temperature, which is characteristic of beriberi neonatorum, was combatted by the daily administration of one to two tablets of yeast (Northwestern Yeast Company), and the subcutaneous injection of 80 c.c. of whole blood. To avoid using the vitamin poor blood of the mother, blood was donated by an interne (W. H. Chapman). On the eleventh day the temperature rose to 102°, fluctuated for a day or two and remained normal thereafter.

The diet consisted of donated breast milk, plus a modified milk formula fed by gavage for the first month. On the first day a daily dosage of three drops of viosterol was begun and continued for two weeks, when it was reduced to one drop daily until the baby was five weeks of age. Then, through an error, for a period of six weeks no viosterol at all was given. At this time, three months old, two-thirds of each parietal bone and part of the occipital bone were markedly flexible. Hence a dosage of nine drops of viosterol daily was begun and a roentgenogram of the head was taken (fig. 10).

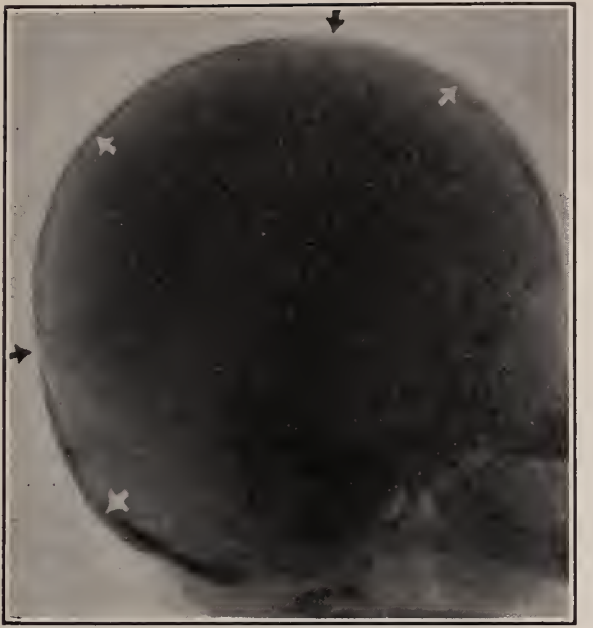

Fig. 12. Same as fig. 10 at five months of age, showing that on 15 drops of viosterol daily calcification progressed rapidly (white arrows). Black arrows indicate anterior and posterior fontanelles.

At four months the roentgenogram and palpation showed very little improvement (fig. 11). The viosterol was, therefore, increased to fifteen drops daily. On this dosage cranial ossification progressed rapidly, although there was present a two-plus craniotabes at five months when the last roentgenograms of the head (fig. 12) and of the wrists (fig. 13) were taken. It is noteworthy that, although the parietal bones were well ossified, the distal end of the radius shows marked cupping. Shortly afterward the baby left the hospital and was not heard from for several months, when it was reported to have died of pneumonia.

### SUMMARY

Careful clinical records were kept of one hundred and thirty-three cases who were given varying doses of Mead's activated ergosterol over a period of several months. Three of these were pregnant mothers who received six drops daily from the third to the ninth months. All of them reported an unusual sense of well-being during pregnancy and were delivered without difficulty of very well developed and vigorous children. These babies had less craniotabes and costomalacia than the average. We agree with Ertl and Hain[14] that "in pregnant women vitamin D increases the strength and influences favorably the heart, bones, musculature, digestion and elimination."

Forty-three of the cases reported were newborns. The ones on the newborn service at the Multnomah County Hospital, thirty-three in number, who received ten drops of Mead's viosterol daily were noticeably superior to those not receiving it. They were more vigorous, nursed more avidly and regained their birth weight most rapidly.

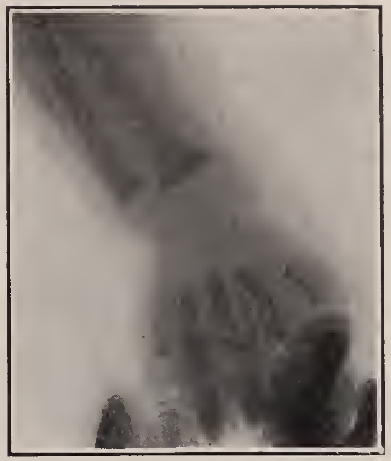

Fig. 13. Same as fig. 10 at five months. Although the cranial bones are rapidly approaching normal calcification, there is marked cupping of distal end of radius.

All of the newborns who were followed for several months developed definite signs of rickets, even though they received six to ten drops of viosterol. When the dosage was increased to from twenty to thirty drops, active rickets rapidly disappeared.

### CONCLUSION

1. In the Pacific Northwest it has been impossible to give enough cod liver oil to prevent or to cure rickets.

2. Pregnant women to whom six drops of Mead's viosterol are administered daily are delivered of unusually well-formed and vigorous infants.

3. Newborns who receive ten drops of this activated ergosterol solution daily from birth are noticeably superior to those not receiving it.

4. Ten drops of viosterol daily is not sufficient to prevent the development of rickets.

5. Active rickets will be cured if twenty to thirty drops of Mead's viosterol be given daily.

6. We have seen no harmful effects from dosages up to fifty drops daily.

7. From this study we recommend dosages as follows:

(a) Pregnant women, 10 to 20 drops from the third to the beginning of the ninth month.

(b) Newborns, 20 drops daily.

(c) Twins and prematures, 30 drops daily.

(d) Active rickets, 20 to 30 drops daily.

(e) Children to and through puberty, 10 to 20 drops daily to prevent and cure postural defects.

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**Present Status of Convalescent Serum Therapy.** The impression of W. H. Kellogg, Berkeley, Calif., (*Journal A. M. A.*, Dec. 21, 1929), gained from an analysis of some published reports, is that convalescent serum is of value in the treatment of poliomyelitis, and that its use should be encouraged and extended. Several facts seem fairly conclusive from the literature studied. These may be stated as follows: Whatever benefit may be expected from convalescent serum can be realized only when it is given in the preparalytic stage. The intrathecal route would seem to be as safe, and certainly as effective, as less direct methods. The intramuscular or intravenous route is possibly as effective as the intrathecal, excepting for a certain amount of delay in reaching the spinal fluid with antibodies, but further studies on this point are desirable. The prophylactic use of convalescent serum given subcutaneously or intramuscularly in time of epidemic, as suggested by Flexner, is amply backed up in its rationality by experiments with monkeys and is probably a valuable preventive measure, albeit limited in application by difficulties in obtaining serum. Further information on the value of convalescent serum is needed and, in the prosecution of studies, the prime requisite is a real control represented by a series of untreated cases in every respect the same as the treated cases. This similarity must include time, stage of the epidemic, and clinical type. Every published study should give full details as to how and why certain cases were selected for controls. Published studies on the effect of convalescent serum should exclude all abortive cases on account of the uncertainty of diagnosis. Characteristic symptoms of central nervous system involvement should be present, and cases in which spinal fluid examinations are not made should be tabulated separately.

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# INGUINAL HERNIA *

## CLINICAL APPLICATION OF EXPERIMENTAL STUDIES

Millard S. Rosenblatt, M.D.
PORTLAND, ORE.
Formerly Resident Surgeon, Harper Hospital,
Detroit, Michigan

Inguinal hernia is always of great interest because of its frequency. It is not my purpose to discuss technic. It is, however, my plan to consider certain fundamental principles.

The physiologic result in the repair of inguinal hernia is dependent on many factors: (1) the age of the patient, (2) the type of hernia, (3) the complete removal of the sac, (4) primary wound healing, (5) efficient repair of the abdominal wall.

The first two of these factors do not concern us in the discussion, although they have important bearing on results. The complete removal of the sac is necessary and is recognized by all to be one of the important steps. Primary wound healing is practically assured in the present era, if gentleness in handling tissue is practiced. The repair of the abdominal wall opens up the discussion of fundamental factors based on surgical anatomy, physiology and histology.

In this repair should red muscle be sutured to white fascia? In the literature conflicting evidence regarding this can be found. Seelig and Chouke from clinical experience and experimental studies on dogs feel that normal muscle will not unite firmly with fascia, and that it is a useless procedure to suture muscle to Poupart's ligament in the repair of a weak abdominal wall.

Andrews agreed with Seelig and Chouke that such union does not occur and that, theoretically, it would not be expected. He even feels that it is harmful so to suture, as he believes the internal oblique acts as a sphincter to close the canal and also that suture damages the muscle.

Koontz, in repeating this work of Seelig and Chouke with modifications, concluded that the internal oblique muscle and Poupart's ligament unite firmly in the dog when these structures are brought into apposition by suture, if the areolar tissue is first carefully removed. Rosenblatt and Cooksey working independently later secured the same results as Koontz.

The internal oblique muscle was sutured to the reflected margin of Poupart's ligament, the areolar tissue being previously removed. As can be seen in

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* Read before the Fifty-fifth Annual Meeting of Oregon State Medical Society, La Grande, Oregon, May 16-18, 1929.

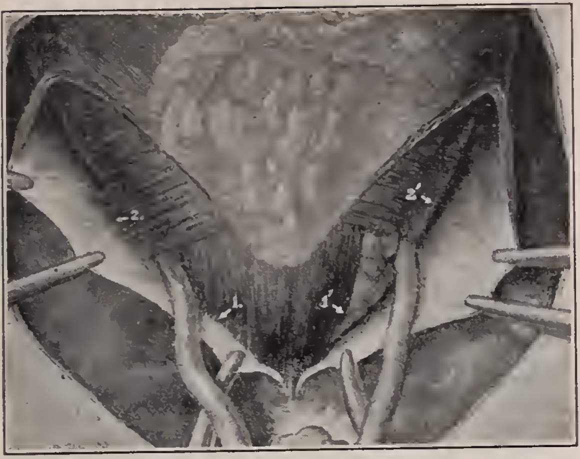

Fig. 1. 1. Rectus muscle firmly adherent to Poupart's ligament sixty days after suture. 2. Edge of internal oblique muscle firmly adherent to Poupart's ligament. 1' and 2' unoperated side. (From Rosenblatt and Cooksey.)

figure 1, considerable tension was necessary, especially on the rectus muscle sutures. These details are clearly shown on the normal and the operated side. Firm union between the muscle and fascia resulted in all cases, and was of such character that muscle could be torn from muscle as easily as the union between the muscle and fascia could be overcome.

In the thigh operations the anterior iliac fascia was incised, reflected and sutured, so that a counterpart of Poupart's ligament was constructed. On one side of the dog this was sutured to the underlying muscle without removal of the very evident areolar tissue intervening in this region. On the other side the same procedure was used, except that the areolar tissue on the fascia and muscle was carefully removed. The latter side in all cases showed good union of muscle to fascia, whereas the side in which the interposing areolar tissue was not removed, showed very slight union in only one case (figs. 2 and 3).

We feel, therefore, that the success of the muscle-fascia union depends on the complete removal of the interposing elements of areolar tissue and fat. To allow this synovial-like membrane of areolar tissue to exist between the sutured elements is to invite just that situation existing in a joint, nonadherence of insulated structures. The term, muscle-fascia union, is misinforming, and has probably caused a portion of the controversy existing on this subject. Despite the fact that one sutures muscle to fascia, the union is as fascia to fascia. Of course, one does not expect a red muscle cell to become a white fascia cell. The muscle bundle, however, is surrounded by a sheath of white fibrous connective tissue and each muscle fiber has its neighbor bound to it by the same element, while the entire muscle or group of bundles is likewise held together by white fibrous tissue. The elements for a connective tissue union are therefore present.

As a matter of fact, when muscle is sutured to fascia, without interposing tissue, two things happen: 1. The fascia forms communications with the myomysium, endomysium and perimysium (the white fibrous tissue in and around the muscle). Radiating processes project from ligament to muscle, binding the two firmly together by hundreds of interlacing tentacle-like strands. 2. A portion of the muscle in contact with the ligament is partly replaced by fibrous tissue. This is firmly connected with the fibrous elements above mentioned and with the ligament (figs. 4 and 5).

Gallie and Le Mesurier had advised even in fascia to fascia suture that the areolar tissue should be removed. Hertzler suggests that this difference in results depended on the fibrin reaction being transformed into connective tissue in the cases in which ligatures were tied tightly enough to excite this reaction.

The experimental work which I have presented, plus the identical findings of Koontz, agrees exactly with our clinical experience and that of others.

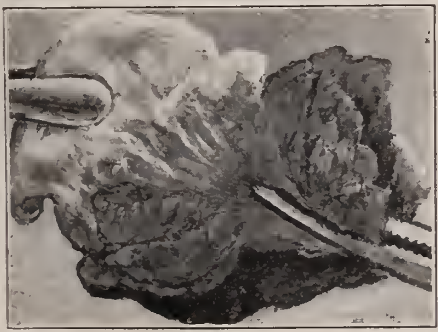

Fig. 2. Firm union between muscle and fascia. Areolar tissue removed before suturing, fourteen days. (From Rosenblatt and Cooksey.)

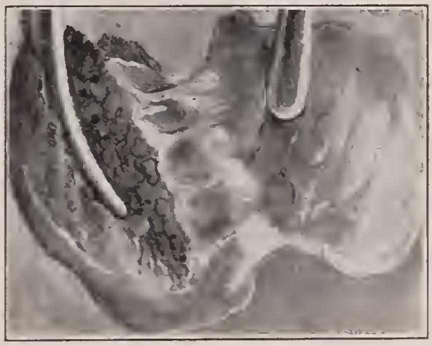

Fig. 3. No serviceable union. Areolar tissue not removed. Same animal, different side from fig. 2. (From Rosenblatt and Cooksey.)

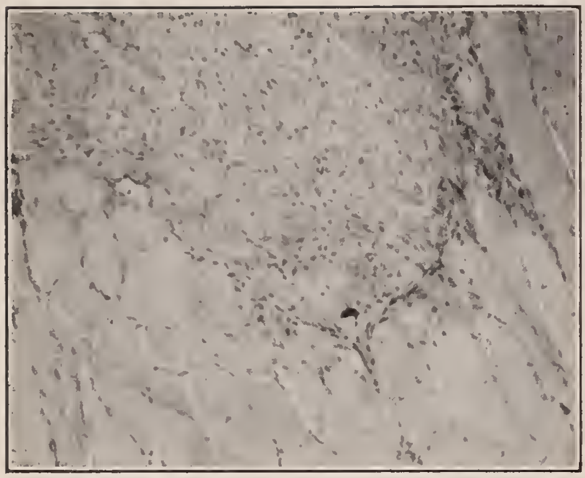

Fig. 4. Showing union of the ligament with the fibrous tissue between and around the muscle bundles. There are many tentacle-like strands anchoring this union. (From Rosenblat and Cooksey.)

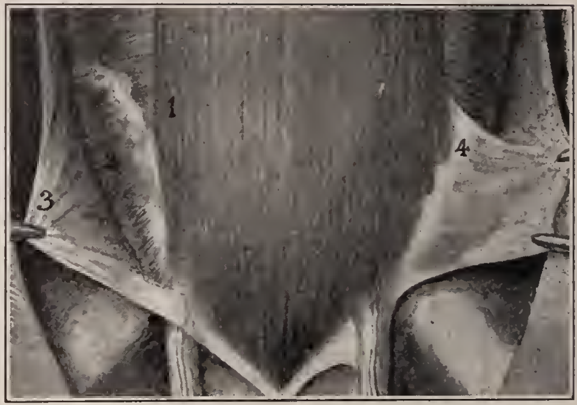

Fig. 6. The left side was operated upon. 1. Edge of rectus muscle after its sheath has been dissected away. 2. Internal oblique muscle showing preperitoneal fat medial to it. 3. Reflected edge of Poupart's ligament. 4. Union of rectus muscle with Poupart's ligament after incision and partial excision of sheath of rectus muscle. Preserved ox fascia sutures were used. (From Rosenblatt and Meyers.)

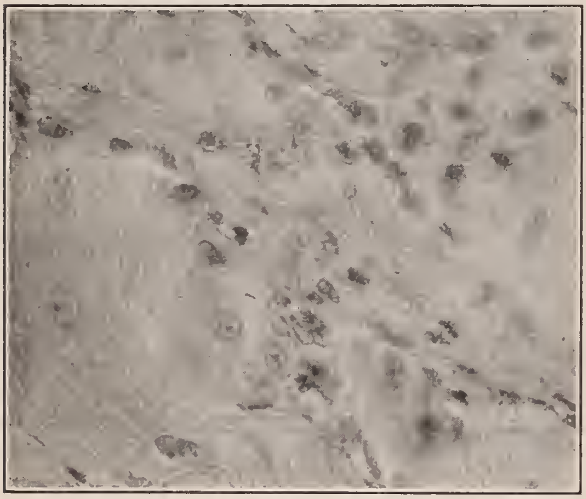

Fig. 5. High power of fig. 4, showing the true connective tissue cell between the muscle bundles which take part in the union. (From Rosenblatt and Cooksey.)

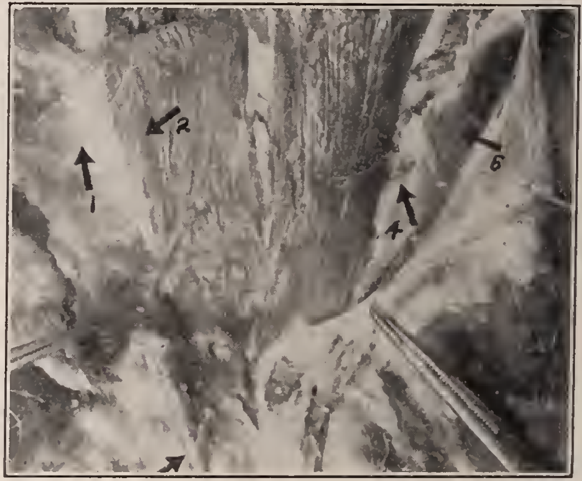

Fig. 7. Actual photograph. Right side operated upon. Tension on right Poupart's ligament shows union strong enough to pull the entire rectus muscle lateralward. (From Rosenblatt and Meyers.)

That is, wherever muscle and fascia have been sutured with care, union results.

Some surgeons, not feeling satisfied that the repair of hernia was well enough done with the ordinary suture material, have used fascia as suture material. Gallie and Le Mesurier have been quoted extensively as contributing to this phase of the subject. It must, however, be emphasized in fairness to McArthur that he was the first to use fascia for suturing muscle to the inguinal ligament. He published his results in 1901 and later, while Gallie and Le Mesurier's appeared only in the last decade.

McArthur used the fascia from the external oblique fascia of the patient, using it as a continuous suture, devising a technic for anchoring the end. Hodgkin, also, has used autogenous fascia sutures in hernia, deriving the suture from the anterior rectus sheath.

Gallie and Le Mesurier have taken fascia lata from the patient for use as muscle fascia suture, using special needles and technic for anchoring the suture ends. This necessitates two incisions, the thigh one being the larger and probably more painful than the inguinal. It seems difficult to ask patients to undergo this double incision, if we feel that we can be successful otherwise. Recently Masson has used a modified Mayo stripper to secure fascia lata through small incisions and this somewhat does away with the before-mentioned objection.

Koontz has used ox fascia preserved in 70 per cent alcohol as suture material for the muscle-fascia

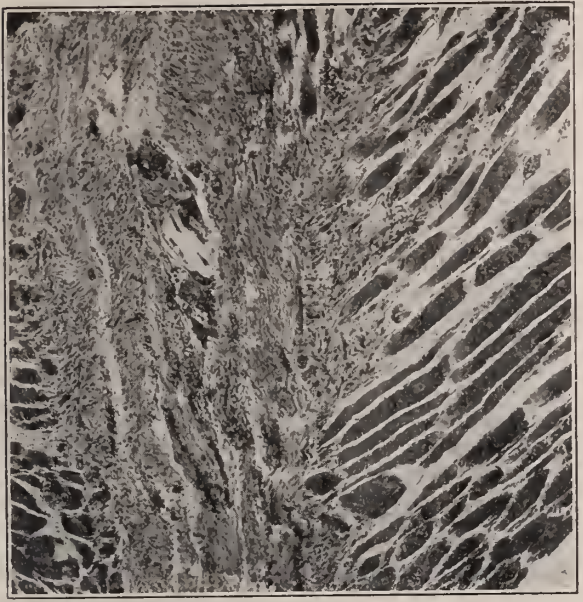

Fig. 8. Ox fascia suture directly through muscle. Shows dense fibrous tissue attachments to the graft through the connective issue cells between and around the muscle. There is some foreign body reaction in the center of the graft. (From Rosenblatt and Meyers.)

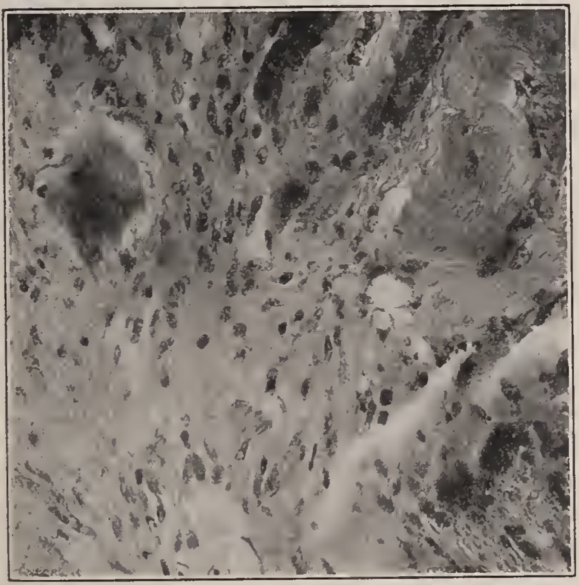

Fig. 9. High power at one side of union of muscle and fascia. (From Rosenblatt and Meyers.)

suture, and has employed a technic similar to that of Gallie and Le Mesurier. In comparing results he found even more firm union with the fascia than with the ordinary suture material.

Rosenblatt and Meyers, using preserved fascia and tendon as suture material and using it as interrupted single sutures tied by an instrumental technic, found very satisfactory results with the fascia but felt that the tendon was not desirable because of difficulty in its handling. It was felt that the fascia grafts had excited some foreign body reaction but practically no round cell reaction. Dense fibrous tissue attachments to the muscle and the fascia, and between the latter two elements could be demonstrated, the connective tissue cell having invaded the grafts and connected with the endomysium and perimysium of the muscle. There was a marked vascularization of the grafts with tremendous proliferation of the capillaries. It seemed that the fascia graft had acted as an element for substitution of living fibroblasts and had also been in part absorbed.

Rosenblatt and Meyers felt that this union secured by use of the preserved ox fascia was even better than that obtained by Rosenblatt and Cooksey in the experimental studies of muscle fascia suture with ordinary suture material. However, by comparison the union with ordinary suture material was so strong that it was not deemed advisable to use this more involved method in the ordinary case of inguinal hernia, as it was felt that this was not necessary.

As a result of our experimental studies thus far, we believe that muscle fascia suture with ordinary suture material is adequate, if the fatty and areolar tissue are first removed. If there is a more involved defect than usual or a recurring case, then fascia suture material is justifiable. In such case it is doubtless a valuable addition to our armamentarium. The procedure of Gallie and Le Mesurier of taking it from the thigh seems rather too hard on the patient, if there is any other method that will do. We feel that taking this material from the external oblique fascia or rectus sheath would be preferable. In a case in which this is not possible or reasonable, the preserved ox fascia would be satisfactory. As has been said, Masson has recently suggested a method, using a modified Mayo stripper to secure fascia lata through small incisions.

## SUMMARY

We have discussed the controversies expressed in literature in regard to the repair of inguinal hernia.

1. Should red muscle be sutured to white fascia? We have quoted the preponderance of evidence which leads to prove that this union may be expected to be very serviceable and that it is really a fascia to fascia suture.

2. We have discussed the various methods of suture, using fascia as suture material. We have felt that McArthur, whose operation antedates the others, is still the superior, because it does not require a second incision as does that of Gallie and Le Mesurier. Masson's method of securing fascia lata is an improvement on Gallie's. If the

necessity for preserved suture material is advisable, preserved fascia may be used successfully. On the whole, however, it appears unnecessary to use these elaborate means in ordinary cases, when such satisfactory results may be otherwise had. In very large defects or recurring cases these fascia methods are valuable.

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# PYLEPHLEBITIS OF APPENDICULAR ORIGIN*

### REPORT OF A CASE

C. F. Schiltz, M. D.,
AMERICAN FALLS, IDA.

This patient, a young lady, nineteen years of age, single, five feet two inches tall, weight one hundred and ten pounds, came to our office for examination on March 9, 1927. She complained of pain in right lower quadrant and was tender on pressure over appendicular region; however, not so tender as many patients with acute appendicitis.

I had seen this patient a few months before with similiar attack, at which time operation was refused. Family history was negative as far as any bearing on this case was concerned. Inquiry revealed that she had had many similar attacks since childhood. She says "two or three times a year as long as I can remember."

Evidently she had vomited more and had more pain than usual for they were ready to have the operation performed. Her general condition was good and she was well nourished; abdomen slightly distended; temperature normal and pulse of 100. In spite of this the patient looked very ill and there seemed to be no question about it being an acute attack of appendicitis, probably gangrenous. There had been no chills up to this time.

Patient was sent to the hospital and operation performed that forenoon. Upon opening the abdomen there was a small quantity of serous fluid seen to escape. The appendix was easily felt to be thickened and, as there were no adhesions, was easily brought out through the wound. It was acutely inflamed, short, thick, and with a portion near the tip which showed some evidence of gangrene. The mesentery of the appendix was much thickened but as yet not friable, holding the ligatures well. There were several enlarged glands in the mesentery.

I had seen this same condition present a number of times before without untoward result, so did not suspect what the future had in store for her and doctors. Used drainage and she was put to bed in good condition.

For the first three days this patient did as well as do most operated upon for gangrenous appendix. She had not vomited, passed flatus, retained liquids, but the pulse had gradually gone up to 120, although the temperature had remained less than 100°. The fourth day opened with vomiting, which she continued at intervals throughout the day.

This was the first day I felt there was something wrong with this patient that I had not noted before. There was just a small amount of drainage, no dullness or pain about the wound and no abdominal distention indicative of peritoneal involvement. She complained of pain over upper abdomen, mainly in the region of the stomach. This was not severe but she looked toxic. I opened the wound but found no evidence of any condition there to produce these symptoms, although I had not forgotten the enlarged lymphatic glands seen at operation.

This condition continued about the same until the thirteenth day after operation, with a gradual increase of temperature up to 103° but without a normal or subnormal temperature. The pulse had been as high as 132. On the thirteenth day, very early in the morning, the patient complained for the first time of being chilly. Shortly after this she began vomiting more frequently than before; was very restless and the pain in the epigastrium more pronounced. She complained of feeling chilly at intervals throughout the day. On the fifteenth day the pulse rose to 134, with poor volume and the temperature was 104.2°, yet no marked chill. At noon on the sixteenth day, she had a severe chill lasting twenty minutes. She complained of pain between shoulders in back.

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* Read before Pocatello Medical Society, Pocatello, Ida., Oct. 24, 1929.

From the seventeenth to the twenty-eighth day she had chills nearly every day. These occured at irregular intervals. Temperature now of septic type. No jaundice was ever present.

Roentgenograms taken during this period showed no abnormal shadows and percussion, no marked increase, if any, of liver dullness.

On the twenty-eight day Dr. W. F. Howard was called in consultation. He agreed that this was an extension upward of the infection from the appendix. This could be either through the lymphatics or the ileocolic veins to the portal. I had decided it was a case of pylephlebitis, of which diagnosis I was more certain than ever when, after aspiration about and in the liver, we were unable to find any free pus.

During this time the patient had become severely emaciated, as we were never able to feed her sufficiently because of the continued vomiting. With this diagnosis, I explained the condition to the family and of course I had little hope to offer. They then removed her to Salt Lake City for treatment. She was aspirated for pus every day for the first week but there was never any found.

The surgeon wrote to me, concurring in the diagnosis. She told me she never had any chills after leaving here but continued vomiting for about four weeks. She was away six weeks when she came under my care again. She had no operation while away, but when she came home was able to take nourishment in small quantities, her temperature having disappeared and if possible was more emaciated than when she went there. There was a marked ascites present now. A few weeks after coming back she weighed fifty-six pounds.

The treatment now consisted of aspiration of ascitic fluid as occasions required, sodium cacodylate intravenously and quartz light. She commenced to put on weight but could not get her legs straightened out, so I put them in extension under ether, with a cast. After six months she was able to walk. She has never been sick since and now weighs one hundred and fifteen pounds, is a picture of health and works every day.

The question is, did she have a pylephlebitis and if so, what should have been the treatment Few of these cases recover, although it is not impossible.

The remaining part of this paper is largely quotation from an article by Ralph Colp, M.D. of Mt. Sanai Hospital, New York. It was published in *Surgery, Gynecology and Obstetrics,* November, 1926.

This dreaded complication of suppurative pylephlebitis occurring in acute appendicitis is now rare because the great majority of cases are operated upon earlier and with a better surgical technic than formerly; yet it occasionally occurs, and its proper treatment is still a mooted question.

From 1916 to 1925 he reports 2841 cases of acute appendictis, in which a diagnosis of appendicular pylephlebitis was made in nine cases, about three-tenths of 1 per cent.

The pathology is variable and inconstant. As a rule, the appendix is acutely inflamed, red and turgid, after gangrenous, and commonly complicated with abscess. The smaller venous radicles of the mesenteriolum are usually thrombotic, and the thrombi may contain bacteria. In some instances these infected thrombi may shoot bacterial emboli into the liver, forming multiple metastatic abscesses, while the portal vein and its tributaries remain normal. More commonly, there is a direct extension of the infected clot into the ileocolic vein and hence into the larger venous channels, finally gaining the intralobular veins of the liver, about which abscesses containing greenish yellow pus are formed. The right lobe is more commonly involved. In some cases the thrombophlebitis remains localized in the ileocolic vein which may be felt retroperitoneally as a firm, hard strand, often reaching the diameter of the little finger; occasionally the inflammation spreads beyond the vessel wall, forming a perivenous abscess or a retroperitoneal phlegmon.

But the portal vein is not the only part by which infection may enter the liver. The lymphatics of the portal fissure, the retrocecal and retrocolonic spaces, and extension of suppuration in the subphrenic spaces may be responsible also for hepatic abscesses.

The pathologic picture of the portal vein varies. Externally it may appear almost normal except for a slight edema, or there may be a definite enlargement with congestion and engorgement, the inflammatory products extending between the layers of the gastrohepatic omentum and into the adjacent lymph nodes, masking the structures to such a degree that the isolation of the portal vein may be extremely difficult. The lumen of the vessel may be filled with a friable, sanguinopurulent clot which may autolyze into a dirty-looking, greenish-yellow viscid material, partly or completely obstructing the vein.

Gerster states, "Chills accompanied by a rise in temperature during the course of appendicitis, however mild as to local symptoms, may and usually do signify the entrance of septic material into the portal and general circulation. It must be looked upon as a sign of the gravest importance."

Jaundice may be present, the abdomen soft and relaxed, with the local conditions subsiding or even healed. Blood cultures as a rule are negative, because the bacillus coli which is usually responsible either rarely breaks into the blood stream in these cases, or, if it does, it is quickly destroyed there or in the liver. The indications for surgical therapy may be divided into the prophylactic, the treatment of frank phlebitis present at the time of operation and a treatment of phylephlebitis manifesting itself after operation.

It is very difficult to decide what should be done prophylactically, if the mesentery of a gangrenous appendix does not bleed when cut, because of thrombus formation. It must be granted academically that some cases with chills and friable thrombotic mesenteries will develop pylephlebitis. Yet the percentage is so exceedingly small that actual damage rather than help might result from the various surgical measures which have been advocated to deal with these infected thrombi. If, however, the case presents all the clinical symptoms of pylephlebitis, or at operation a suppurating phlebitis of the mesentery is evident, then a venous excision or ligation is certainly indicated, done preferable before the appendectomy. Gerster, in 1903, discussing the treatment of pylephlebitis, states, "when much necrosis is found, it would be very desirable to expose and evacuate thrombosed veins. On account of their anatomic relations this is sometimes easy, oftener difficult and mostly impossible."

Culp reports three cases of ligation of the portal vein, all of which ended fatally. The primary cause of death in two of his cases was hepatic insufficiency, the result of diffuse suppuration, and could not be assigned to the direct effect of vein ligation because the patients lived for several days following the operation. Two important findings disclosed by the autopsies were the absence of ascites and the lack of engorgement and congestion of the veins of the abdominal viscera, proving very likely that adequate circulation must have been maintained through collateral channels, even though the portal was occluded.

He summarizes as follows: If this complication occurs or is recognized after appendicular operation, surgical intervention is of little avail, unless indications point to definite liver abscess, when drainage is indicated. The ligation of the portal vein in these cases proved of no value.

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Experiments on Etiology of Influenza. I. S. Falk, R. W. Harrison, R. A. McKinney and G. W. Stuppy, Chicago (*Journal A. M. A.*, Dec. 28, 1929), made a preliminary report of their experiments. From the evidence obtained thus far it seems not improbable that certain pleomorphic streptococci were etiologically related to the influenza outbreak of the winter of 1928-1929.

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# THE EFFECT OF VITAMIN D ON BLOOD COAGULATION TIME*

John C. Brougher, M.D.
VANCOUVER, WASH.

Blood coagulation time has been shown to be prolonged in parathyroid tetany[1,2] and jaundice[3,4]. Lee and White[5], in working out a new and more satisfactory method of estimating blood coagulability, observed that many diseases prolonged coagulation time. Pernicious anemia, splenic anemia, pneumonia, septicemia, pyemia, and purpura hemorrhagica all showed a prolonged clotting time. They noted an acceleration of coagulation time in five patients with typhoid fever, four of whom developed thrombosis.

Brasil[6], in his study of coagulation time in disease, observed that the coagulability of the blood was considerably decreased in such diseases as syphilis, pemphigus, leishmaniasis and cancer. Increased coagulating power was noted in typhoid and plague. He tested several substances as to their ability to alter the coagulation time and found that glucose, neoarsphenamine and tartar emetic proved to be inert. Others, such as bismuth, manganese, sodium, tapioca and calcium chloride, raised the coagulating power. Iron, copper, lead and a weak solution of mercuric chloride decreased it. Sodium citrate and sodium oxalate act peculiarly, as they increase the coagulation power in vivo in the serum, but they lower it in vitro in the plasma.

Selye[7] observed that vigantol (irradiated ergosterol) caused an acceleration of clotting time in patients with long coagulation time. The author found that either cod liver oil or viosterol was efficient in changing the long coagulation time of experimental parathyroid tetany in dogs to normal[2]; he also showed that either of these changed the delayed coagulation time of experimental obstructive jaundice to normal[8].

Since the above experimental data were obtained, cod liver oil and viosterol have been given to patients with a prolonged coagulation time. This was estimated by the method of Lee and White[5] except, instead of using one 8 mm. tube, three 10 mm. tubes were used, and the average time of the three charted. Normal coagulation time in human adults averaged six to eight minutes. Patients with long clotting time from various causes were given either

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* From the Department of Surgery, University of Oregon Medical School.

CHART 1—COD LIVER OIL

| *Patients* | *Disease* | *Coagulation Time* | *Amount Cod Liver Oil* | *Coagulation Time Four Hours Later* |
|---|---|---|---|---|
| Mr. L | Pernicious anemia | 16 minutes | One ounce | 5 minutes |
| Mr. M. | Syphilis, acute rheumatic fever | 14 minutes | One ounce | 7 minutes |
| Mr. L. | Chronic lymphatic leukemia | 11 minutes | One ounce | 5½ minutes |
| Mrs. H. | Colitis | 14 minutes | One ounce | 4 minutes |
| Mrs. L. | Obstructive jaundice | 18 minutes | One ounce | 3 minutes |
| Mr. C. | Lobar pneumonia | 15 minutes | One ounce | 4 minutes |
| Mr. A. | Osteomylitis | 30 minutes | One ounce | 6 minutes |

CHART 2—VIOSTEROL

| *Patients* | *Disease* | *Coagulation Time* | *Amount Viosterol* | *Coagulation Time Four Hours Later* |
|---|---|---|---|---|
| Mr. D. | Syphilis | 15 minutes | 10 drops | 8 minutes |
| Mr. P. | Syphilis | 17 minutes | 10 drops | 9.8 minutes |
| Mr. S. | Acute epididymitis | 15 minutes | 10 drops | 6.8 minutes |
| Mr. H. | Syphilis, chancre | 12 minutes | 10 drops | 5 minutes |
| Mr. G. | Syphilis | 15.5 minutes | 10 drops | 7.2 minutes |
| Mr. H. | Syphilis | 15 minutes | 10 drops | 4.2 minutes |
| Mr. H. | Syphilis | 12 minutes | 10 drops | 5 minutes |

ten drops of viosterol or 30 c.c. of cod liver oil; four hours later another estimation of clotting time was made. The results are presented in the charts below.

It would appear that substances rich in vitamin D, such as cod liver oil or viosterol, are capable of changing a prolonged clotting time in acute infections, syphilis, diseases of the hematopoietic system and obstructive jaundice to normal in a period of four hours. This property of either viosterol or cod liver oil that changes long coagulation time in obstructive jaundice to normal is valuable in the preoperative preparation of jaundiced patients.

## CONCLUSIONS

Blood coagulation time is usually long in acute infections, syphilis, obstructive jaundice and diseases of the hematopoietic system.

Cod liver oil or viosterol, when given orally, changes the long coagulation time to normal within four hours.

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Arts Building.

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**Stramonium as Therapeutic Agent in Sequelae of Epidemic Encephalitis.** Encouraged by the favorable and more complete report of Carmichael and Green on the effectiveness of stramonium in diminishing postencephalitic rigidity, A. L. Jacobson and Frederick Epplen, Seattle (*Journal A. M. A.*, Dec. 28, 1929), undertook to check these observations in a series of cases of both the postencephalitic and the idiopathic paralysis agitans type. From three to ten years ago, each of these patients, except a few with idiopathic paralysis agitans, was stricken with epidemic encephalitis, ranging from an evanescent diplopia to two years of bedfast confinement. In all these cases there was apparent recovery, followed in from one month to three years by various degrees of the parkinsonian syndrome. The U. S. P. tincture of stramonium was employed in doses ranging from 20 to 70 minims (1.2 to 4.3 c.c.), three or four times a day, administered orally. It proved to be an excellent palliative remedy for all symptoms of the parkinsonian syndrome of postencephalitic origin, with the single exception of the pareses, which remain unbenefited. It is of great benefit in idiopathic paralysis agitans, but not so much so as in the syndrome of postencephalitic periods, and large doses are necessary. Toxic manifestations are rare and seemingly evanescent.

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of the Pacific Northwest

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# EDITORIAL

## THE MOST FATAL DISEASE

Much publicity of late has been given to the apparent increase in cancer morbidity and mortality, with the impression that this disease is predominant in its death rate. Tuberculosis, Brights' disease and pneumonia have all been ranked among the highest in the mortality rate, yet statistics demonstrate that heart disease is responsible for a greater mortality than any of these mentioned. Reports recently published by the United States Public Health Service for 1928 show that certain states with an approximate population of 25,000,000 had two hundred twenty-eight deaths from heart disease out of every 100,000, as compared with one hundred and six from kidney disease, one hundred and five from cancer and one hundred from pneumonia. The fact is also presented that deaths from heart disease are increasing. During the period from 1917 to 1925 in the registration area of the United States, there was an increase of population amounting to about one-third, while deaths from heart disease practically doubled and the number of deaths caused by heart disease as a contributing factor increased eighty-one per cent, although the number of deaths from all causes increased only about one-seventh.

It is noticeable that heart disease is particularly a disease of early life, since practically seventy-five per cent of all cases developed in children under ten years of age as compared with about twelve per cent in persons over forty years. In the period 1921 to 1927, out of every 100,000 children from five to nineteen years of age twenty died of heart disease annually in the registration area. This means that in this area, including thirty-seven states and eighty-two per cent of the total population of the country, heart disease was the third highest in the list of causes of death among children.

Little can be done for prevention or relief of congenital cases of heart disease. The acquired cases are more frequently due to infections, grouped under the designation "rheumatic." The incidence of infections and rheumatic diseases associated with damaged hearts ranges from twelve per cent in scarlet fever, increasing in diphtheria, chorea, and rheumatism, to tonsillitis with sixty-six per cent. It is believed the so-called rheumatic conditions are due to some infecting organism which is especially prone to enter the system through defective teeth and diseased tonsils. Among five thousand school children, tabulated under the supervision of the United States Public Health Service for a period of four years, of those whose tonsils were removed following serious tonsillar infection in the past, twenty out of every hundred had attacks of rheumatism and four out of every hundred suffered from heart disease. On the other hand, among children with apparently normal tonsils only twelve out of every hundred presented rheumatic symptoms and less than one had heart disease. These facts emphasize anew the necessity of constant supervision over the conditions of teeth and tonsils among young school children. There was a time when children were supposed naturally to be subject to so-called "growing pains." Observing parents and physicians should remember that young children do not normally suffer from pains. There is a strong probability under these conditions that an infection is present which may be the precursor of subsequent serious heart affection unless recognized and properly treated in the early stages.

## RELIEF FOR ADAMS-STOKES SYNDROME

For many years one of the most puzzling heart lesions was that condition termed Adams-Stokes syndrome. It was long deemed one of the most baffling and mysterious of cardiac diseases encountered in practice. Although the pathology has been well established, its treatment has for the most part resulted in failure or very little permanent relief. Price and Nisse* discuss this syndrome at length, explaining the most successful forms of treatment. Occurring with auriculoventricular block, the syndrome is due to temporary anemia of the brain, resulting from bradycardia. This may result from a suddenly developed complete block, partial heart-block in which there occurs complete block, causing a temporary standstill of the ventricles, or a condition of complete heart-block permanently established, in which syncope is produced by temporary standstills of the ventricles, due to their diminished irritability. The bradycardia may accompany sclerotic, gummatous or acute inflammatory lesions of the auriculoventricular tissues, overaction of the vagus or diminished irritability of the myocardium.

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* Price, F. W. and Nisse, B. G.: The Treatment of Adams-Stokes Syndrome Due to Auriculoventricular Block. Am. Heart Jour., Vol. V, No. 2, Dec., 1929.

The aim of treatment is to increase the ventricular rate. If the cause be pressure from a gumma or inflammatory changes resulting from this, its resolution may be anticipated from specific treatment. Since, however, the majority of cases result from sclerotic changes, relief of this condition cannot be anticipated. Hence most efforts have been directed towards ventricular stimulus in order thereby to increase the circulation. Various reports of success and failures have been published under thyroid and atropine administration. The action of atropine is accomplished through its effect on the vagus nerve. Since, however, persistent block of severe grade is rarely of vagal origin, it is rarely affected by this drug. Within recent years successful treatment of these cases by atropine has been reported by a number of writers. Its effect is to increase the rate of the heart by stimulating the sympathetic nerve endings in the cardiac muscle. It also results in dilating the coronary arteries, with improvement of nutrition of the myocardium. It has been demonstrated both experimentally and clinically that adrenalin may prevent a temporary standstill of the ventricle by increasing its rate. It may also improve conductivity and thus lessen the degree of existing pressure heart-block. Its disadvantage is the short duration of its action, but it is the only potent therapeutic measure at our disposal during an actual attack. Ephedrin, so closely allied to adrenalin, has been successfully employed. It can be administered by mouth instead of hypodermically, as is necessary with adrenalin and its effect persists for several hours.

The authors ascribe the greatest benefit to barium chloride, the value of which in the treatment of this disease is due to its action in increasing the irritability of the heart muscle. It is said to increase the ventricular rate either by stimulating the excitability of the existing idioventricular pace maker, or by calling into action new ectopic ventricular foci. If used alone large doses of this drug must be employed but it can be used in comparatively small dosage, if combined with adrenalin which excites ventricular contractions through stimulation of the sympathetic. Price and Nisse report two striking cases relieved by this treatment. A man of sixty-nine had been subject to attacks for a year, with such increased frequency that he had been bedridden several months. At times the suspension of the heart action had been of such length that he was considered dead. The ventricular rate was twenty-six per minute. The careful administration of adrenalin at first reduced the frequency of attacks, followed by recurrence. The administration of barium chloride, one-half grain twice and later thrice daily, resulted in complete suppression of the attacks of syncope, although the ventricular rate did not rise above thirty-one per minute. This freedom from attacks was reported for a period of six months. The case of a woman, aged sixty-five, presented a similar history. Her attacks were relieved by a combination of barium chloride and adrenalin. Likewise there followed a period of six months with no recurrence of attacks. In both patients the heart-block and bradycardia persisted but syncope was averted. The conclusion of this study is that the exhibition of barium chloride administered by mouth, supplemented by adrenalin given hypodermically, is indicated for the prevention of the recurrence of Adams-Stokes syndrome due to auriculoventricular block.

## AIDS TO LITERARY RESEARCH

Whenever one prepares to write a medical paper, it is essential that he should have access to literature bearing on his topic, whereby he may obtain needed information. If he is obliged to depend alone upon his own researches or the literature obtained from his neighbors, ordinarily he will not succeed in preparing anything of conspicuous value. The necessity which he lacks is an index of medical literature, from which he can obtain references for his investigations. Such information is obtainable from the Quarterly Cumulative Index Medicus, published by the American Medical Association, which is the greatest work of the kind existing in any country. Starting a few years ago in a small way with many handicaps over a certain period, it has developed to such an extent that it engages nearly a score of workers, whose time is devoted to listing titles and authors appearing in some fifteen hundred medical journals published in all the languages of the world. This includes the scientific and important medical publications of all nations, exclusive of trade and manufacturers' journals and those fostered by individuals. No physician can successfully prepare a paper of interest and value without making use of this index. It should either be in his possession or accessible to him in a library where desired references are obtainable. The twelve dollars annual subscription for these volumes fails by a very large sum to pay the cost of its publication, the deficit being provided from funds of the American Medical Association, which thus functions for the promotion of scientific knowledge among the profession of this country.

The second aid provided by the Association which it is desired to mention in this connection, is the "package library," prepared by the workers on the Cumulative Index. In these packages are assembled leaves from medical journals, containing papers pertaining to diseases treated by the majority of physicians. As these are the latest publications on important medical discoveries and discussion of the day, their value can be readily appreciated. These packages are available to the Fellows of the Association who are permitted to borrow them on application. Thus physicians who do not have access to a well-equipped working library can to a large extent offset this lack by the use of these packages. Attention is called to these efforts conducted by the American Medical Association to assist physicians of the country in their studies and research work, because it is believed the profession at large is not familiar with these facts. If advantage is taken of information thus available, physicians distant from medical centers can to a large extent overcome the necessity of being obliged to depend on their own resources for study and investigation.

## PACIFIC NORTHWEST MEDICAL ASSOCIATION

Pacific Northwest Medical Association will meet in Butte, Montana, July 1, 2, and 3. The Medical Association of Montana and the Health Officers of the state will meet on the preceding day, June 30. A local committee of arrangements has been appointed, consisting of Drs. T. J. Shanley, R. C. Monahan and A. H. Tash. Dr. E. G. Balsam, Secretary of the State Association, will collaborate from Billings. It is expected that a large percentage of the visitors at the Montana State meeting will remain for the Pacific Northwest meeting and that there will be visitors from North and South Dakota and Wyoming. Drs. Fred Attix, E. M. Larson and Alfred Karsted are volunteer members of the publicity committee. The following imposing list of speakers has thus far been engaged. These men are all in the prime of life, active in research work in their particular lines and should make an impressive program.

Dr. Edwin I. Bartlett, Associate Professor of Surgery, University of California Medical School, a pupil of Dr. J. C. Bloodgood. Three lectures, one of which will probably be on "Surgical Pathology."

Dr. Hilding Berglund, Professor of Medicine, University of Minnesota Medical School. Erstwhile Exchange Professor of Medicine at Pekin Medical School. Titles: "The Anemias and Their Therapeutic Possibilities." "The Value of Gastric Analysis and a Discussion of the Causes of Epigastric Distress." "The Therapeutic Possibilities and Responsibilities in the Various Types of Bright's Disease."

Dr. George B. Eusterman, Head of Gastroenterologic Section at the Mayo Clinic. Titles unannounced. Three lectures on gastroenterologic subjects.

Dr. Emile Holman, Professor of Surgery, Stanford University Medical School. Titles: "Pulmonary Suppuration: Important Factors in Its Development and Its Repair. A Clinical and Experimental Study." "The Surgical Treatment of Pulmonary Suppuration: Postoperative Pulmonary Abscess, Chronic Bronchial Fistula, and Pulmonary Tuberculosis." "The Treatment of Burns from Inception to Complete Epithelization."

Dr. Allen K. Krause, President and Director of the Desert Santorium and Institute of Research, Tucson, Arizona. Three lectures, one of which will be on tuberculosis.

Dr. Chauncey D. Leake, Professor of Pharmacology, University of California Medical School. Three lectures on applied pharmacology.

Dr. Andrew S. Lobingier, Surgeon, Merritt Building, Los Angeles, Calif. Titles: "Surgery of the Gallbladder." A paper on "The Pathologic Lesions of the Duodenum" or "of the Ascending Colon and Hepatic Flexure."

Dr. T. M. Rivers, research worker in the Rockefeller Institute for Medical Research. Three papers on the viruses of some of the infectious diseases.

# MEDICAL NOTES

## OREGON

North Pacific Surgical Association. The eighteenth annual meeting of the North Pacific Surgical Association was held at Portland, Dec. 6-7. Dr. Otis B. Wight, of Portland, president of the association, acted as chairman. Dr. Emmett Rixford, San Francisco, was a guest of the society and delivered several addresses. Other speakers were Drs. Horace Whitacre, Tacoma; Karl Martzloff, Portland; H. T. Buckner and C. F. Eikenhary, Seattle; R. B. Dillehunt, Portland, and W. B. Burnett, Vancouver, B. C. At the conclusion of the meeting Dr. Charles D. Hunter, Tacoma, Wash., was elected president for the ensuing year. The next annual meeting is planned to take place at Tacoma.

Clinic Building Assured. Approval by the board of regents of the preliminary plans for the proposed clinic building for the University of Oregon Medical School at Portland practically assures early construction of the new unit, the cost of which is estimated at $400,000.

Hospital Damaged by Fire. The Washington county hospital at Hillsboro was badly damaged and the safety of thirty inmates imperiled Dec. 10, when fire broke out in the basement. The patients were removed without injury, several being taken to the Jones hospital.

Hospital Proposed. Community leaders in St. Johns have initiated a movement to convert the James John school building, which is soon to be vacated, into a general hospital.

Convention Chairman Honored. At a recent meeting of the Portland City-County Medical Society, Dr. Ernest A. Sommer of Portland, chairman of the local committee on arrangements for the American Medical Association convention last July, was presented with a wrist watch by the society and the Oregon State Medical Society, in appreciation of his services at the time of the national convention.

Resignation Tendered. Dr. J. N. Smith, who has served for fourteen years as superintendent of the state home for feeble minded at Salem, has submitted his resignation to the state board of control. He intends to retire from practice and will make his home at Salem. His successor is his former assistant at the institution, Dr. Roy Byrd.

Portland City and County Medical Society held the annual election of officers at a banquet and meeting at the Multnomah Hotel on December 19. Dr. Frederick A. Kieble was honored with the presidency to succeed Dr. E. B. McDaniel. Others elected were: Vice-president, Dr. Marr Bisallion; secretary, Dr. Homer Rush; treasurer, Dr. Kittie Plummer Gray.

Members of the council selected were Drs. Eugene Rockey, Guy Strohm, William Livingston, E. W. St. Pierre, John G. Cheeteam and A. J. Bettman. Addresses were delivered by Drs. Richard B. Dillehunt, Edward O. Sisson and the retiring president.

Portland Academy of Medicine held its annual meeting at the University Club Dec. 12, with Dr. Frank B. Kistner of San Francisco as the principal speaker. New officers for the society were installed as follows: President, Dr. Frank Menne; president-elect, Dr. Ralph C. Fenton; first vice-president, Dr. Theodore W. Adams; second vice-president, Dr. Lyle B. Kingery; secretary, Dr. Harold B. Myers; treasurer, Dr. Marr Bisaillon.

Coos-Curry Counties Medical Society held the annual election of officers at a banquet meeting at the Chandler Hotel in Marshfield, December 13. Those elected were: President, Dr. R. H. Mast of Myrtle Point; vice-president, Dr. O. K. Wolf of Marshfield; secretary-treasurer, Dr. J. M. Simpkin of Marshfield.

Health Director Resigns. Dr. Emily T. Balcom, for the past year director of the county health unit at Medford, tendered her resignation to the county court Dec. 1. Her place since has been filled by Dr. G. F. White, formerly connected with the Rockefeller foundation.

Health Survey Completed. The recent survey of health conditions in Portland was completed in December. Dr. James Wallace, field director of the American Public Health association, who supervised the survey, has left for his home in New York. The complete report of the work will be published early next year.

Dr. F. H. Vincil of Astoria has been elected president of the staff of St. Mary's hospital at Astoria.

Weddings. Dr. Edwin Douglas Warren and Miss Jane Ann Bodine, both of Portland, were married in that city on December 28. Dr. George H. Adler of Klamath Falls and Miss Madelon K. Boie of Portland were married in Silverton on December 24.

## WASHINGTON

Friendship with Clemenceau Recalled. The death recently of former premier Georges Clemenceau has brought to light the fact that there resides in this state a physician who in his medical student days enjoyed friendship with the illustrious French statesman. Dr. Alfred C. Kinney, Sr., veteran practitioner of Seaview, together with his brother, the late Dr. August C. Kinney, was a member of a small class in microscopic anatomy which Clemenceau, also a physician, conducted in New York City in 1871.

Shortly thereafter Clemenceau, who occupied the post of instructor in French in a woman's college in Connecticut, was recalled to France. Before his departure he sold his own microscope to Dr. August Kinney, who used it for many years afterward in his practice at Portland, Ore. Unfortunately this valuable instrument was disposed of before its owner's death, but it is believed by Dr. Alfred Kinney that it is still in use somewhere in Portland.

Shrine Hospital Surgeon Appointed. Dr. A. W. Adams, formerly assistant to the chief surgeon at the St. Louis Shrine hospital, has been appointed to fill the position of chief surgeon at the Spokane Shrine hospital, which was made vacant by the death of Dr. Mitchell Langworthy. Dr. Adams will also engage in the private practice of orthopedic surgery at Spokane.

Hospital Addition Opened. The new addition to St. John's hospital at Port Townsend was formally dedicated at a tea and reception held Dec. 11. The new structure is three stories in height and of modern, fireproof construction. Space is provided for a new surgery and x-ray department as well as for a maternity floor and general surgical and medical work. The enlarged hospital is now able to accommodate one hundred patients.

New Hospital at Omak. Dr. J. Fred Mills has opened a modern fifteen bed hospital at Omak.

Radiologic Honor Received. Dr. Harold B. Thompson, Seattle, roentgenologist, was elected vice-president of the Radiological Society of America, at a recent annual meeting, held in Toronto, Canada.

Dr. A. H. Johnston of Heppner has sold his practice to Dr. G. W. Ritteman of Newberg, and will leave soon for Rochester, Minn., to take a course in postgraduate work.

Dr. R. W. Christensen, formerly of Dufur, has opened an office in Redmond.

Dr. Rex L. Ross has been elected president of the staff of St. Elizabeth's hospital at Yakima.

Dr. R. P. Carter, until recently assistant medical director of the Mountain View Sanatorium at Tacoma, has opened an office in the Wallingford district at Seattle.

Dr. Max S. Wright, formerly of Sedro-Woolley, has become associated with Dr. George Crabtree in his practice at Mt. Vernon.

Dr. A. C. McPhaden of Concrete has moved to Mount Vernon, where he will be associated with Dr. J. M. Fettes in the recently established Mount Vernon clinic.

Dr. D. M. Prince, a graduate of the University of Virginia Medical School, has located for practice in Mount Vernon.

Dr. S. A. Keim of Wenatchee has moved to Bellingham where he will engage in practice.

Dr. R. J. Alcorn, who has been engaged in medical work for the Department of the Interior in Alaska, and his wife Dr. C. E. Alcorn, have opened offices at Cashmere.

Dr. R. G. Gale, until recently in charge of the Klickitat hospital at Klickitat, has moved to Vancouver, where he will practice.

Dr. A. J. McCannel of Silverton has returned home from an extended European trip.

Cowlitz County Medical Society held its regular monthly business meeting at the Lewis-Clark hotel in Centralia Dec. 9.

### IDAHO

County Health Unit Assured. A full time county health unit for Bonneville county was assured on Dec. 3 when the board of county commissioners voted to appoint Dr. B. L. Arms of Franklin, N. Y., as full time county physician. He is a graduate of the medical department of the University of Vermont, and was formerly state bacteriologist in Oregon. Since that time he has been engaged in laboratory and public health work in Alabama and Florida.

Hospital Drive Planned. Plans have been announced by officers of the Church of the Nazarene for a drive for funds with which to complete the Samaritan hospital at Nampa.

County Physician Appointed. Dr. Joseph Fremstad of Burley has been appointed county physician of Cassia county.

### OBITUARIES

Dr. X. L. Anthony, Spokane, Wash., well known eye specialist of the Inland Empire, died at his home Nov. 29, following a prolonged illness. He was born in Nova Scotia in 1870 and graduated from McGill University Faculty of Medicine, Montreal, Canada, in 1905. After practicing for twelve years in Montana, he moved to Spokane in 1909, where he confined his work to ophthalmology. In later years Dr. David Hartin became associated with him. He was prominent in civic affairs and was for many years a member of the board of directors of the Y. M. C. A. A son, Dr. Marc Anthony of Spokane, survives him.

Dr. Clayton A. Hoover, one of the pioneer physicians of Idaho, died at his home in Blackfoot, Nov. 29. He was born in Maryland and graduated from George Washington Medical School, Washington, D. C., in 1875. He first located in Montpelier in 1882 and practiced there until 1905, when he went to Blackfoot. For twelve years he occupied the position of superintendent of the state insane asylum at Blackfoot.

Dr. Albert Lee McClanahan, Mount Vernon, Wash., died in the Virginia Mason hospital, Seattle, Nov. 19, following a brief illness, aged 57 years. He was born in Strasburg, Virginia, in 1872, and graduated from St. Louis University School of Medicine in 1904. He first practiced in Nome, Alaska, and later in several cities in Washington, including Seattle, Yakima and Ellensburg. He had resided in Mount Vernon for the past seven years.

Dr. Albert A. Davis, Seattle, Wash., died at his home Dec. 8, aged 58 years. He was born in Henniton, Ill., in 1871, and graduated from the Chicago College of Medicine and Surgery. Chicago, Ill., in 1910. He located in Port Angeles about nineteen years ago and engaged in the practice of medicine there, at the same time editing one of the pioneer newspapers of that city. Later he moved to Seattle, where he remained until his death.

Dr. Philip M. Strowbridge, Portland, Ore., died following an operation Nov. 25, in the Los Angeles County hospital, where he was serving an internship, aged 28 years. He was born in Portland in 1901, and graduated from the University of Nebraska Medical School, Omaha.

Dr. J. L. Shorey, Woodburn, Ore., the second oldest practicing physician in Marion county, died at his home Dec. 15, following a brief illness, aged 64 years. He was born in 1865 at Bangor, Maine, but moved to Oregon with his parents when he was a youth. He graduated from the College of Physicians and Surgeons, Baltimore, Md., in 1891. After practicing in Portland for a short time, he moved to Woodburn, where he remained until his death.

Dr. John Lucius Garner, Harrisburg, Ore., died at his home Dec. 13, following a short illness, aged 63 years. He was born in 1866, and graduated from Louisville Medical College, Louisville, Ky., in 1887. He had practiced at Harrisburg for the past six years and was local health officer of that town.

Dr. William E. Gomm, for several years a medical practitioner in Spokane, Wash., died at his home in New Denver, B. C., Dec. 17, aged 63 years. He was born in Savannah, Georgia, in 1866, and graduated from Bellevue Hospital Medical College, New York City, in 1888. He located in Spokane soon afterward and practiced there for five years. Later he moved to New Denver, where he had charge of the hospital of the Slocan mines.

## REPORTS OF SOCIETY MEETINGS

### OREGON

#### KLAMATH AND LAKE COUNTIES SOCIETY

Pres., E. D. Lamb; Secty., C. C. Rugh

Klamath and Lake County Medical Society met Nov. 26 in Klamath Falls at the home of Dr. E. D. Lamb, the retiring president.

Dr. G. H. Adler of Klamath Falls made an address on "The Laboratory End of Transfusion." This was accompanied by motion picture films, illustrating the technic of blood transfusion. Dr. Benson of Bend talked on his impressions of the European clinics which he recently visited.

Newly elected officers of the society are: President, Dr. Charles E. Leithead, Lakeview; vice-president, Dr. L. L. Truax, Klamath Falls; secretary, Dr. C. C. Rugh.

#### LANE COUNTY MEDICAL SOCIETY

Lane County Medical Society held the annual election of officers at a meeting held at the Osborn Hotel in Eugene, December 19. Dr. Irvin R. Fox of Eugene was elected president. Other officers chosen were: Vice-president, Dr. C. D. Donahue, Eugene; secretary-treasurer Dr. Harry G. Talbot.

A paper on "Indications for Ethmosphenoidal Operation in an Apparently Healthy Nose" was read by Dr. O. R. Gullion.

Dr. G. S. Beardsley discussed "Repair of Old Birth Trauma and Subsequent Delivery."

## WASHINGTON

### CLARK COUNTY MEDICAL SOCIETY

Pres., R. D. Wiswall; Secty., W. B. McMakin

Clark County Medical Society held a meeting at the Hotel Evergreen in Vancouver, Dec. 10, at which officers for the forthcoming year were selected. Those chosen were: President, Dr. C. R. Zener; vice-president, Dr. E. G. Flagg; secretary-treasurer, Dr. J. A. Darby, all of Vancouver. An address illustrated by motion pictures on the subject of fractures was given by Dr. M. E. Steinberg of Portland, Ore.

### KING COUNTY MEDICAL SOCIETY

Pres., B. T. King; Secty., H. L. Goss

A general meeting of King County Medical Society was held in the auditorium of the Medical-Dental Building, Seattle, Dec. 2, with President B. T. King in the chair. About one hundred members were present. Minutes of the meeting of Nov. 4 were read and approved.

Dr. C. W. Sharples delivered a memorial address with appropriate remarks on the lives of the members who have died during the past year. These were Drs. Frederica Phillips, J. T. Wolf, H. A. Simon, A. E. Burns and S. P. Woodin.

Dr. O. F. Lamson read a paper, "End-results Following Cholecystectomy." This was based on the study of one hundred and thirty cases of gallbladder disease treated by cholecystectomy during the past twelve years. More than ninety have been traced by letter or interview. Best results have followed cases in which preoperative symptoms and pathology were of severe character. Low grade cholecystitis of long standing has not given as good results, due to envolvement of associated organs. In the presence of adhesions following cholecystectomy, gastroenterostomy is advisable as excision of adhesions is likely to result in recurrence. The age of the patient should not influence one's judgment in advising operation. If the patient is a good surgical risk and there are no unusual complications, it is justifiable to perform multiple operations, thereby saving undue worry, pain and expense. The paper was discussed by Drs. E. O. Jones and G. S. Peterkin.

Dr. R. H. Somers read a paper on "Hemorrhagic Disease of the Newborn." The patient was a ten pound, full term infant delivered by version. There was nothing abnormal in its appearance until the third day, when a small abrasion in the forehead began to ooze, developing into a hematoma. Stools were dark but not tarry. On the fourth day the baby appeared jaundiced, quite dehydrated, fontanel depressed. A mass was palpable in the region of the left kidney. On the fifth and sixth days 30 c.c. of whole blood were given subcutaneously. There was bleeding from the puncture wound. On the sixth day hemoglobin was 15 per cent, red cells 1,700,000, white cells 16,000. Autopsy findings were presented in detail, which showed hemorrhage below and into the tentorium, massive retroperitoneal hemorrhage from left suprarenal, bloody fluid in left thoracic cavity and abdomen.

Dr. G. M. James reported the case of a Greek, aged 45, with symptoms of intestinal obstruction. Examination showed a thick walled tumbler in the lower bowel with the open end directed upward. Under ether an unsuccessful attempt was made to deliver it with obstetric forceps. Then one blade was used which caught the edge of the glass and it was delivered.

Dr. Roger Anderson presented a case of "Actinomycosis of the Mandible" which was discussed by Drs. Snively, Wanamaker, Jones and Schoffman.

The following applications for membership were read: Drs. J. L. Ash, J. W. Baker, A. L. Balle, R. B. Bramble, C. M. Helwig, G. M. James, R. H. Loe, D. G. Leavitt, J. K. Martin, J. W. McDowell, F. E. Parsley, V. W. Ritter, D. A. Thorp, J. N. Wilkenson.

The following officers were nominated for the ensuing year: President-elect, Dr. R. J. McCurdy; secretary-treasurer, Drs. Alfred Bowels and Mabel Seagrave; trustees, G. C. Miller, J. T. Whitty, S. F. Wiltsie, C. W. Knudson.

Delegates to the meeting of the state medical association were elected as follows: Drs. B. T. King, Roger Anderson, A. B. Hepler, M. W. McKinney, C. E. Hagyard, C. W. Shannon, D. C. Hall, H. E. Coe, W. K. Jones, J. T. Dawson, Oscar Proctor, A. H. Peacock, W. C. Speidel, F. T. Maxson, E. W. Young.

A meeting of the Surgical Section of King County Medical Society was held at the Medical-Dental Building Auditorium, Seattle, December 9, with Dr. J. Tate Mason in the chair.

Dr. Emmett Rixford, professor of surgery of the Medical School of Stanford University, San Francisco, was guest of the society. He delivered an address on "Coccidioidal Granuloma." His first case of this disease was seen in 1894. He gave a vivid description of the fungus ulcer on the back of the neck and the methods of arriving at a diagnosis. Another rapidly fatal case presented at autopsy tubercles of the lungs and abdominal organs, suggestive of miliary tuberculosis but diagnosed by the presence of coccidiodes from the sputum and tubercles. The disease has been found largely among laborers in the California oil fields. About one hundred and fifty cases have been reported. A variety of races were represented. Lantern slides showed pathologic changes in various tissues and the organism in various stages of development. No drug has been discovered to benefit the disease and the mortality approximates one hundred per cent.

Following this address Dr. Rixford spoke on "Mechanics of the Production of Fractures." This was applied to many forms of fractures. He dealt particularly with spiral fractures, illustrating the method of producing these conditions.

### PIERCE COUNTY MEDICAL SOCIETY

Pres., C. F. Engels; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held at United States Veterans' Hospital No. 94, American Lake, November 26, Dr. C. F. Engels, President, in the chair.

The application of Dr. C. W. Lemery was read and referred to the Board of Trustees.

The program of the evening was a symposium on malaria in the treatment of neurosyphilis.

Dr. E. W. Janes read a paper on "The History and Results of Malaria as used in the Treatment of Neurosyphilis." Dr. H. E. St. Antoine gave the treatment in detail as carried out at the American Lake Hospital. Dr. F. R. Sims gave a report of the cases which had been under treatment in the Arkansas Veterans' Hospital for two years past.

These patients had all had previous antiluetic treatment, and the feeling was that a great improvement had been made with the use of malaria. Dr. Loren Wood described the details of treatment as used at the American Lake Hospital. Dr. Spiro Sargentich then presented four patients who had had the treatment. One showed great improvement, one moderate improvement, one no improvement and one a serologic cure but no clinical improvement. These papers were discussed by Drs. A. C. Stewart, J. A. LaGasa, C. R. McColl and C. F. Engels.

### SNOHOMISH COUNTY MEDICAL SOCIETY

Pres., H. R. Seccy; Secty., A. B. Murphy

Snohomish County Medical Society held its annual banquet at the Everett Golf and Country Club in Everett, Dec. 3. Dr. H. W. Bortner, recently elected president, presided.

Addresses were made by Drs. N. S. Thompson of Everett, W. B. Penny of Tacoma, D. C. Hall of Seattle, and others.

### WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., J. T. Rooks; Secty., C. J. Johanneson

Walla Walla Valley Medical Society held a meeting at Walla Walla, Dec. 10.

Dr. Frank R. Menne, professor of pathology at the University of Oregon Medical School, Portland, gave an address on "Ulcerative Colitis." By the aid of lantern slides he demonstrated various types and causes of the disease, showing anatomic changes produced by each type.

Dr. Marr Bisaillon delivered an address on "Differential Diagnosis of Pulmonary Tuberculosis." He described the various types of lung diseases that may simulate tuberculosis, with special emphasis on malignant tumors which represent about three per cent of all growths. He also spoke on bronchiectasis, lung abscess, empyema and other conditions.

### WHATCOM COUNTY MEDICAL SOCIETY

Pres., J. R. Morrison; Secty., Charles Teel

Whatcom County Medical Society elected officers for the ensuing year at a meeting in Bellingham, Dec. 2.

Dr. E. C. Keyes of Bellingham was honored with the presidency. Others elected were: first vice-president, Dr. L. P. McCalla; second vice-president, Dr. C. C. Hills of Custer; third vice-president, Dr. C. S. Hood of Ferndale; secretary, Dr. W. A. Hulbrush; treasurer, Dr. I. W. Powell. The committee on ethics is composed of Drs. I. E. Beebe, J. R. Morrison and Charles Teel.

Dr. H. E. Cleveland of Burlington, president of the Washington State Medical Association, was a guest of the society and spoke briefly. Motion pictures, depicting the treatment of infections of the hands, were presented.

### YAKIMA COUNTY MEDICAL SOCIETY

Pres., W. A. Gaylor; Secty., J. L. McDonald

Yakima County Medical Society held its annual meeting and election of officers in Ellensburg, Dec. 10, where the members were entertained at a banquet by the retiring president, Dr. A. T. Taylor.

The new officers are: President, Dr. P. J. Lewis, Yakima; vice-president, Dr. W. K. Cocklin, Yakima; secretary, Dr. Rex L. Ross, Yakima; treasurer, Dr. F. W. Nagler, Yakima.

Among the guests of honor in attendance were Drs. R. B. Dillehunt of Portland, Ore., dean of the University of Oregon Medical School and H. E. Cleveland of Burlington, president of the Washington State Medical Association.

### TRI-COUNTY SOCIETY

Pres., F. C. Gibson; Secty., J. H. Einhouse

Tri-County (Latah, Benewah, Clearwater) Society held a meeting at Potlatch, Ida., Dec. 7. There was a good attendance of the membership.

The feature of the program was the Dr. DeLee motion picture, "The Normal Breach Presentation."

Dr. F. C. Gibson presented a paper on "Treatment of Fractures," illustrated by lantern slides.

The following officers were elected: President, Dr. J. Harry Einhouse; vice-president, Dr. R. T. Hopkins, Orofino; secretary-treasurer, Dr. O. M. Husted, Elk River.

## BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

The Clinical Aspects of Venous Pressure. By J. A. E. Eyster, B.Sc., M.D. Professor of Physiology, University of Wisconsin, Associate Physician Wisconsin General Hospital, Madison, Wis. Cloth, 121 pp., $2.50. The Macmillan Co. New York, 1929.

In this monograph we find a very complete discussion of the physiologic and pathologic factors concerned in the production of venous pressure. Moreover, an instrument is described, which was devised by Hooker and Eyster and modified by Eyster and Hipple, for measuring venous pressure. This in principle and appearance is similar to the mercury sphygmomanometer for estimating arterial pressure but differs from it in containing a colored aquaeous fluid instead of mercury in the graduated vertical glass tube, and in having a flat metal disc for measuring venous pressure instead of an arm cuff.

The disc is much like a watch case and consists of an air chamber covered on the top by glass and below by rubber dam, having a square hole in its center to look through and see the vein. This chamber is placed over a prominent vein on the hand or arm with the rubber dam covered with glycerin so as to make it adhere closely to the skin. Air is then forced into this chamber with a rubber bulb until the point when the vein is seen to collapse while looking through the glass window in the top of the chamber. At this point the manometer reading is done. The patient must first rest fifteen minutes in a recumbent position and when the reading is made the vein observed must be approximately at the level of the heart. The normal readings vary from 40 to 60 mm. of water, rarely exceeding 110.

Normal venous pressure is in part the pressure-residue in the vascular system after resistence of the arterioles, capillaries and venules has been overcome. It is also in part the result of the termination of the venous system in the heart cavity, in which positive pressure always exists. Under usual conditions, upon venous pressure depends the volume output of the heart, for with increase of venous pressure in health there is a corresponding increased ventricular filling and output.

Exercise and upright position tend to augment venous pressure and in violent exercise with holding the breath it may become as high as 500 mm. of water for the time being, owing to positive pressure in the lungs. But in normal persons the heart can take care of any amount of venous pressure by increased work under ordinary conditions of physical exertion. Augmented venous flow only tends to increase the flow of blood through the heart from the venous to arterial side so that excessive variations in peripheral venous pressure are prevented. Thus, the minimum stroke volume output of the heart may be increased three to six times in exercise which is facilitated by the more rapid rate.

Cardiac decompensation occurs when the heart, through degeneration or intoxication, cannot move the blood adequately from the venous side into the arteries. The author believes that mechanical stretching of the heart muscle initiates hypertrophy and later degenerative processes. This thesis is opposed by many, as Christian, who points out that overload caused by hypertension frequently does not produce cardiac dilatation and hypertrophy, which he attributes to some unknown factor, and he does not believe in so-called work hypertrophy of the heart. Moreover, Eyster himself states that the normal heart can take care of any usual load put upon it, so why should hypertrophy be caused except by some pathologic factor?

In cardiac decompensation the weakened heart muscle is filled beyond its physiologic capacity and its contractions become feeble and inefficient for this reason. Thus a vicious circle becomes established because the heart is still further weakened by lack of coronary blood and therefore oxygen supply, and decompensation increases with mounting venous pressure, often two or three times the normal, until rest, therapy or venesection reduces the load on the right heart. Then the heart may increase its work sufficiently to overcome venous engorgement and both the heart output and venous pressure return to normal. Swelling and congestion of the liver and spleen, engorgement of the lungs, scanty urine from stasis and compression of the glomeruli in passive congestion of the kidneys, with edema and ascites from filtration of fluid from engorged venules favored by lack of oxygen, are all well recognized clinical signs of decompensation which it is unnecessary to elaborate.

The author emphasizes that generalized rise of venous pressure only occurs with a failing heart and it is upon this fact that the value of precise venous pressure determinations depends. Again, the height of these readings (often 200 mm. of water or more) is not nearly so important as whether they tend upward or downward on repeated estimations.

The chief value of Eyster's work lies in these repeated venous pressure readings in heart failure because only by this precise means can one secure the earliest knowledge of its approach, and only by this means may one forecast accurately the beginning of failure or recovery from actual decompensation and have a daily guide regarding its fluctuations. In decompensation Eyster affirms that venesection should be done at a much earlier stage to obtain efficient results but this may only be accomplished by following the trend of venous pressure readings. In decompensation both recovery and the reverse can most easily be perceived by following venous pressure estimations.

In pneumonia more useful information can be obtained by venous pressure estimations than in any other disease, excepting cardiac decompensation. The earliest evidence of heart failure may thus be determined and venesection or other methods may be at once instituted to overcome it.

Progress in clinical medicine has always been brought about chiefly by newer and more precise methods of studying bodily states, as is illustrated by discovery of the stethescope, application of the thermometer, roentgen rays and sphygmomanometer. Whether the last has conferred an unmixed blessing on mankind some may question. In any event the writer of this small volume is to be highly congratulated upon introducing one more means by which we may precisely study venous pressure by a practical clinical instrument. We find numerous case histories in the book, including various types of cardiac decompensation and pneumonia in which the usefulness of the apparatus is demonstrated. While it is true that the field of venous pressure study is somewhat circumscribed, yet it is undoubtedly of much importance in congestive heart failure and should prove of great interest to all those engaged in general or internal medicine. WINSLOW.

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SURGICAL AND MEDICAL GYNECOLOGIC TECHNIC. By Thomas H. Cherry, M.D., F.A.C.S. Professor of Gynecology, New York Post-Graduate Medical School and Hospital. With 558 Half-tone and Line Engravings from photographs and pen and ink drawings by the author. Cloth, 678 pp. $8.00. F. A. Davis Co., Philadelphia, 1929.

This book is exactly described by its title. Very little space is devoted to diagnosis or symptoms. It is intended for those who understand surgery, and only the essentials of each procedure are presented, although there is no break in continuity of the text, which is profusely illustrated with diagrammatic drawings. The author very wisely limits the discussion of each phase of his subject to one operation, that which has proven most satisfactory in his experience, thus presenting to the reader a tried and successful method for application to each case. Anatomy is predominant throughout the book, the structures and their relations being discussed in each condition before the operative treatment is presented. Definition and pathology are included, the discussion of carcinoma of the uterus being especially interesting.

The first section closes the surgical aspect of gynecology with a practical presentation of suture and drainage materials; the proper treatment of patients newly operated upon, with a consideration of surgical complications. A few pages are devoted to anesthesia, the author favoring the spinal method. The second section deals in a practical way with the medical side of gynecologic practice, taking up all those procedures which may be handled in the office to advantage. The treatment of sterility and gonorrheal infections is well presented in this part. D. W. JOHNSON.

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HEMORRHOIDS. The Injection Treatment and Pruritus Ani. By Lawrence Goldbacker, M.D., Philadelphia. Illustrated with 31 Half-tone and Line Engravings. Some in Colors. 205 pp. F. A. Davis Co. Philadelphia, 1930.

In the treatment of internal hemorrhoids the author uses the submucous injection of 5 per cent phenolized oil which was first brought out by Albright some twenty years ago and has been the popular method of treatment for many years by a certain group of physicians. The only thing new about the method is the increased dosage. In the hands of others 5 to 30 minims according to the size of the hemorrhoid has been satisfactory. The author uses 5 to 10 c.c. in each hemorrhoid. The reviewer has injected thousands of hemorrhoids and has failed to see a one large enough to take 10 c.c. of solution. As injections of one-half to three c.c. have always been satisfactory in cases where the treatment is called for, no advantage is seen in increasing the dose.

When the author states that nearly every case of internal hemorrhoids may be successfully and permanently cured without operation, he gives evidence of an enthusiasm untempered with experience. Many cases of internal hemorrhoids have been operated on which had been "cured" by the injection treatment, given by men who are competent to use it.

The author has also had excellent results in the treatment of pruritis ani in a limited number of cases with the interstitial injection of 5 per cent phenolized oil. Hanes is the father of the treatment of this condition by the injection of irritating chemicals under the skin and has done an enormous amount of work along this line. Dilute hydrochloric acid has found the most favor in his hands. Benacol in oil has been much advertised the last two years. If the author's solution works as satisfactorily as benacol or hydrochloric acid, it will be a decided improvement as both of these preparations have been quite painful.

The chapters on general considerations are so superficial that they have hardly a place in a work which is to be read by a scientific body of men. Such statements as "the function of the rectal crypts is supposedly the secretion of a lubricant to aid in the passage of feces through the anal canal," and "it is said that the columns of Morgagni help guide the feces into the anal canal" are certainly out of place, as obscure rumors have no place in a physiologic or anatomic discussion. The work for its size is well illustrated, about half of the plates taken from "Disease of the Rectum" by Cook.

CROOKALL.

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THE GREAT APES, A Study of Anthropoid Life. By Robert M. Yerkes, Professor of Psychobiology in Yale University, and Ada W. Yerkes. Pp. 652, $10.00. Yale University Press, New Haven, 1929.

There is universal interest in a study of the history and manners of the great apes. Certain characteristics so similar to those of man incite an attention in these animals greater than that accorded to any other representatives of the animal kingdom. The authors of this work have devoted years to the study of these primates, and in this volume is recorded a mass of fascinating information which will appeal to every reader. The apes described are the gibbon, the orang-outan, chimpanzee and gorilla. The mischievous and fantastic gibbon lives in the treee tops, swinging himself from one tree to another with the greatest agility and speed. He seems to be most interesting in the wild state of nature. The orang-outan, of a larger build than the gibbon, presents a much more interesting life history. He is often found in captivity, the pride of exhibitors, and at times has acquired sufficient education to be useful in performing certain forms of labor. The chimpanzee appears to have the greatest degree of brain capacity. He is the ape commonly appearing as a performer in the circus. He seems to delight in exhibiting his accomplishments before interested spectators. One quoted author has labored assiduously to develop speech in one of these creatures. He thinks he has taught him a few words which suggest human speech. These animals display certain traits that endear them the the most to humans. Some have seemed to possess real affection and solicitude for their masters. Structurally, the gorilla approaches the nearest to man. While in size he is comparable to the human, his physical strength is greatly in excess. He exhibits the most vicious temperament of any of these creatures, often occupies inaccessible and remote regions, and for many years was somewhat mythologic in history.

In accounts of these apes the authors have assembled information from the writers of all nations, from the earliest periods when their descriptions appear to the writings of latest date. In addition to data thus obtained, they have supplied information secured by their own observations in the Primate Laboratory of Yale University. For the further study of these anthropoids a laboratory has been established in Florida, where they may be reared under conditions comparable to those of their original habitat. For a thorough description of the characteristics and habits of these great apes, no work is obtainable that is superior to this in its varied information and its readable context.

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TULAREMIA. History, Pathology, Diagnosis and Treatment. By Walter M. Simpson, M.S., M.D., F.A.C.P. Director of the Diagnostic Laboratories, Miami Valley Hospital, Dayton, Ohio, etc. With 53 Text Illustrations and 2 Colored Plates. 162 pp. $5.00. Paul B. Hoeber, Inc. New York, 1929.

"And the hare of their flesh shall ye not eat, and their carcass shall ye not touch; they are unclean to you." Leviticus, XI, 6, 8. Tularemia, also called deer-fly fever, plaque-like disease of rodents, rabbit fever, rabbit disease, etc., has come into prominence since 1924, up to which time only twenty-four cases had been reported, while over eight hundred have been recognized since that time in the United States. The disease is infectious and so transmitted by bacterium tularense to man secondarily as a result of direct contact with tissues or body fluid of an infected animal, or as a result of indirect transmission from animal to man by certain ticks and flies. Wild rabbits, hares, ground squirrels, wild rats, wild mice, sheep, muskrats, opossums, woodchucks and other animals have been found infected with the disease and in numerous cases have infected human beings. Laboratory workers in large numbers have suffered from this disease. The clinical manifestations of the disease are herein well illustrated by the many excellent photographs of the disease and its complications. Better keep the disease in mind when examining patients with small pinched-out ulcerations, with unusually large glandular swellings.

MOSIMAN.

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THE COMMON HEAD COLD AND ITS COMPLICATIONS. By Walter A. Wells, A.M., M.D., F.A.C.S., Professor of Otolaryngology, Georgetown University, Washington, D. C. 225 pp., $2.75. The Macmillan Company, New York, 1929.

This book is written for perusal by the layman and offers much sensible advice pertaining to the common cold. Attention is called to the great economic loss from this malady in reports of insurance companies and great industrial institutions. While microorganisms are ordinarily considered the primary factors, the author considers that atmospheric factors are equally important. In the discussion of suitable wearing apparel it is stated that, while silk is

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not equal to wool as a protector against cold, it surpasses the heat conserving value of cotton or linen. The author lays stress on the predisposition in nasal obstructions from pathologic septum and turbinates as well as the factor of infected tonsils and adenoids. He questions the value of so-called vaccine treatment for cure or prevention of colds. The importance is stressed of separating the person thus afflicted from other members of the family. The author expresses no enthusiasm for toughening children by exposing knees, arms and legs in cold weather. This volume contains much good sense which could be profitably read by the general public.

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DIATHERMY IN THE TREATMENT OF GENITO-URINARY DISeases with Especial Reference to Cancer. By Budd C. Corbus, M.D., F.A.C.S., Past Professor of Genito-urinary Diseases in the University College of Medicine, etc., and Vincent J. O'Conor, S.B., M.D., Assistant Professor of Genito-urinary Surgery in the University of Illinois College of Medicine, etc. Revised Edition with Thirty-three Illustrations. 200 pp. $5.00. The Bruce Publishing Co., St. Paul and Minneapolis, 1929.

This small volume is an excellent exposition of its subject, based upon its authors' large experience. The subject matter is divided into medical and surgical diathermy. Under medical diathermy they consider the treatment of gonococcal infections in the male and female, nonspecific endocervicitis, perinephritis and pyelitis. Under surgical diathermy they take up rather briefly benign lesions, such as venerial warts, carbuncle and prolapse of the female urethra, chancroidal uesions, ureteroceles and calculus impacted in the lower end of the ureter. They devote most space to treatment of malignant conditions, such as carcinoma o fthe penis, the urethra and the bladder. The book contains thirty-three illustrations and these help to clarify the text.

NELSON.

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PRACTICAL MASSAGE and Corrective Exercises with Applied Anatomy. By Hartvig Nissen, Late President of Posse Normal School of Gymnastics of Boston, Mass., etc. Illustrated with 72 original half-tone and line engravings. 271 pp. $2.50. F. A. Davis Company, Philadelphia, 1929.

As indicated by its title, this book offers practical suggestions in the application of massage. Part I deals with manipulation and manual applications to the muscles of the extremities and the trunk, details being given for each procedure with notation as to their effects. Part II, designated applied anatomy and corrective exercises, discusses necessary manipulations for groups as well as individual muscles and their development. Part III deals with massage and exercises for specific conditions of disease. The views expressed in this volume represent an experience of thirty years in the practice of massage by the author.

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PETTIBONE'S TEXTBOOK OF PHYSIOLOGICAL CHEMISTRY WITH EXPERIMENTS. Revised and Rewritten by J. F. McClendon, Ph.D., Professor of Physiological Chemistry, Medical School, University of Minnesota, Minneapolis. Fourth Edition, 365 pp., $3.75. The C. V. Mosby Company, St. Louis, 1929.

The object of this book, as stated by the author, is to present an intermediate text to cover the general field of physiological chemistry in such a way as to give students a familiarity with compounds important from a biochemical viewpoint, and to acquaint them with the fundamental processes which go on in the animal body. Part I deals with physical chemistry in its relation to physiological chemistry. There are chapters discussing carbohydrates and proteins, while much attention is given to digestion in the mouth, stomach and intestines. Metabolism of various foods is considered. Part II is devoted to laboratory work with details of the technic for the necessary examinations. This is a book which will gratify students on this subject.

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THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 13, No. 2. (Chicago Number, September 1929.) Octavo of 232 pages with 61 illustrations. Per Clinic year, July, 1929, to May, 1930. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This volume contains clinical reports on many medical topics of much interest. These include descriptions of epistaxis in cardiovascular conditions, arterial hypertension with electrocardiographic studies, pernicious anemia and coronary accidents. Keeton discusses the objects and methods of treating pneumonia, laying emphasis on the necessity of supplying fluids to compensate the dehydration from the disease. He cites several cases apparently cured by the administration of glucose solutions by mouth and subcutaneously. Cases of meningitis are discussed by Robertson due to pneumococcus type III. There are discussions of the ulcer problem, peptic ulcer, cancer of the stomach and ulcerative colitis. These are only a part of the subjects presented.

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THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month). Volume 9, number 5. (Philadelphia Number—October, 1929) 299 pp with 111 illustrations. Per Clinic Year (February 1929 to December 1929). Paper $12.00; Cloth, 16.00. Philadelphia and London, W. B. Saunders Company.

Among the many clinical reports in this volume, Deaver and Burden discuss cases of peptic, duodenal and gastric ulcers, presenting cases of each with their relations to other organs, also an unusual case of large hernia through the foramen of Winslow and one of right paraduodenal hernia. Babcock describes a case of musculospiral palsy following treatment by injection of sodium cacodylate and another of extensor paralysis of the foot following injections of alcohol for sciatica. The possibility of such results is emphasized. Under thoracic surgery, Flick describes extrapleural thoracoplasty in treatment of pulmonary tuberculosis, also operations for other pulmonary suppurative conditions. There are interesting clinical reports of numerous other surgical conditions.

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PROGNOSIS IN EYE INJURIES. John A. Donovan, Butte, Mont. (*Journal A. M. A.*, Dec. 21, 1929), states that it will never be possible to foretell the possible results in severe eye injuries, but the probabilities are that useful eyes can be obtained in a great majority of cases. With improved therapeutic methods and careful observation, the possibilities of sympathetic blindness may be more frequently eliminated at not too great a cost. When infection is imminent, mutilation is beyond repair, the patient's lost time is of vital importance, or other conditions are present in which the eye physician must be the sole judge, immediate enucleation is imperative. When ultraconservatism fails, enucleation is always at one's command. The public has acquired the opinion that enucleation is of preeminence in surgery. The patient becomes a hero and the physician is soon forgotten; so, naturally, it may always be the surest and easiest way out for the operator who is unwilling to assume unnecessary responsibility. The saying "Dead men tell no tales" may be paraphrased in ophthalmologoy to "The enucleated eye relieves all worries."

# NORTHWEST MEDICINE

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## ORIGINAL CONTRIBUTIONS

## CHRONIC DUODENAL STASIS*

H. L. Bockus, M.D.
PHILADELPHIA, PA.

My reason for selecting this subject is to review with you an experience with a fairly large number of cases and an attempt at correlation and discussion of certain clinical features which are too little understood. The cases included have only one thing in common, undue delay in the passage of ingesta through the duodenum. Duodenal stasis cannot be considered as a true clinical entity. The term is used in much the same sense as one would use gastric stasis. It describes a state of delay in duodenal emptying. It may be dependent upon a variety of functional or organic disturbances. All grades of duodenal delay are encountered, from mild transient stasis of functional origin to almost complete obstruction due to organic disease.

Cases showing duodenal stasis may be divided into two broad groups: (I) intermittent occlusion due to pinching of the terminal duodenum by the mesentery, and (II) stasis dependent upon organic disease.

### I. Intermittent Arteriomesenteric Occlusion of the Duodenum

Approximately 75 per cent of cases of duodenal stasis which we have seen have been attributed to this cause. It is only seen in visceroptotic patients, affording an explanation for the upper abdominal complaints in some of them. Too often in the past the dyspeptic visceroptotic has either been therapeutically abandoned to the group of "hopeless neurotics" or operated upon without justification.

Rokitansky,[1] in 1849, was the first to suggest that compression of the duodenum by the superior mesenteric vessels might be responsible for dilatation and stasis within the duodenum. In 1889, Glenard[2] expressed the belief that the drag of a dilated, ptosed stomach caused at times a dilatation of the duodenum. He felt that partial compression of the duodenum by the mesenteric vessels was physiologic, allowing time for the admixture of chyme with duodenal juices. Kundrat[3] was the first to describe cases of "Persistent Incomplete Obstruction of the Duodenum with Gradual Dilatation of the Stomach and Duodenum" in the literature. He reported three cases in 1891. He attributed the condition, as did Albrecht[4] in 1899, to compression by the root of the mesentery.

Albrecht called the entity, "Constriction of the Duodenum Due to Mesenteric Traction." He reproduced it experimentally by inducing mesenteric traction. Snitzler[5] reported a fatal case in 1895 as "Compression of the Duodenum Associated With Lordosis." He considered lordosis to be an important etiologic factor. In 1900, Robinson[6] described his impressions of the condition gathered from a study of thirty cases which he autopsied. He believed that in subjects with visceral ptosis and

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* Read before the Fortieth Annual Meeting of Washington State Medical Association, Yakima, Wash., Aug. 29-31, 1929.

* From the Gastrointestinal Clinic, Graduate School of Medicine, University of Pennsylvania.

coils of intestine in the pelvis, the superior mesenteric artery, vein and nerve compress the transverse segment of the duodenum in such a manner as to cause dilatation of the duodenum proximal to its contact with the aforementioned vessels. He considered this to be an important factor in gastroduodenal dilatation in people with visceral ptosis. He thought the condition common in people over forty-five years of age, particularly multiparae and attributed many deaths indirectly to duodenal occlusion in people beyond this age.

Connor[7] (1906) speculated on the relationship between acute dilatation of the stomach and chronic dilatation of the duodenum due to mesenteric compression. He estimated that two-thirds of a large series of cases of acute dilatation of the stomach had a concomitant dilatation of the duodenum down to the mesentery. In 1907, Bloodgood[8] reported two cases of acute dilatation of stomach and duodenum down to the mesentery and one chronic case. All three went to autopsy. The duodenum was collapsed distal to the mesentery.

Codman[9] (1908) believed chronic obstruction of the duodenum by the root of the mesentery a common cause of epigastric symptoms and of pathology in the neighborhood, including ulcer. The Kelloggs[10] considered ptosis of the hepatic flexure an important contributing cause of mesenteric occlusion. McKenty[11] found ptosis of the cecum and right colon in nineteen of twenty-six cases. The diagnosis of a mobile cecum is important in the etiology according to him. Barling,[12] Vanderhoff,[13] Melchior,[14] Engelbach,[15] Jordan[16] and others have made valuable contributions to the literature. Wilkie[17] has recently reported a series of seventy-five cases, with an excellent review of the subject.

The transverse duodenum is the most fixed organ in the abdomen. It is attached to the posterior wall by peritoneum and has no mesentery. It is held by the ligament of Treitz and attached to structures near the celiac axis and left crus of the diaphragm. It is in relation with the aorta and the vertebrae (usually the third lumbar) posteriorly and the mesentery of the small intestine, containing the sheath of the superior mesenteric artery, vein and nerve anteriorly. Barling speaks of the duodenojejunal angle as a transit point from a relatively fixed portion, the transverse duodenum, to a mobile portion of bowel, the jejunum.

During embryonal life the third portion of duodenum may be looked upon as a pivot, around which rotation of the colon occurs, bringing the cecum across from left to right and carrying the root of the mesentery with the superior mesenteric vessels athwart the duodenum. Wilkie speaks of the wide variations in rotation which are seen in different individuals and believes some cases of mesenteric occlusion are dependent upon such developmental anomalies.

One must visualize the normal transverse duodenum as being flattened by the pressure of the mesentery containing the mesenteric vessels. Albrecht has shown that this constriction may be increased by traction on the mesentery downward, and complete occlusion accomplished, if traction is made downward and backward. It is not hard to understand why this condition is associated with visceroptosis. Any factor which lessens the space between the superior mesenteric vessels on the one hand and the aorta and vertebrae on the other, favors mesenteric occlusion of the duodenum.

The following contributing factors must be considered:

1. Imperfect rotation of the colon so frequently seen in visceroptosis (Wilkie).
2. Drag on the mesentery.
    a. Upright posture. Compression of the duodenum does not occur in quadrupeds.
    b. Ptosis of the small intestines.
    c. Ileal stasis (Jordan, Lane).
3. Short mesentery which does not rest in the pelvis or against the anterior abdominal wall. This is also supposed to render more acute the duodenojejunal angle (Duval et al).[18]
4. Relaxed abdominal wall not affording support for the mesentery. The abdominal wall is the most important unit of visceral support (Robinson).
5. Ptosed or low right colon or mobile cecum causes the median colic artery to be directed downward and tends to parallel the superior mesenteric artery, causing additional pressure on the duodenum (Kellogg). This is called the colic type of mesenteric occlusion by some.
6. Long transverse mesocolon with ptosis of the transverse colon tends to diminish the space occupied by the transverse duodenum.
7. Primary renal ptosis pulling on the colic flexure.
8. Lordosis diminishing the size of the duodenal bed.
9. Lower position of the transverse duodenum (fourth lumbar) having an effect identical with 8.

Devine[19] and Barber[20] feel that the condition is not purely mechanical but is dependent upon some neuromuscular derangement. Turk[21] ascribes the condition to the action of toxins upon the wall of the intestine. These factors may play a secondary role but existing evidence points toward a primary mechanical factor.

### SYMPTOMATOLOGY

Mesenteric occlusion of the duodenum, although rare, occurs more frequently than is indicated by a perusal of the literature. One year ago a series of ten cases was reported. Ten additional cases have been encountered during the past year. These twenty cases form the basis for the discussion which follows.

Twelve patients were females. The literature indicates a higher incidence in that sex. The age extended from twenty-four to sixty-six years, with an average of thirty-eight years. Several patients dated the onset of symptoms to their earliest recollection of childhood. The average duration of symptoms was eleven and one-half years. An onset of indigestion in childhood, with long intervals of good health alternating with periods of discomfort, is a common type of history elicited. Frequently a patient of congenital visceroptotic habitus will be entirely free from symptoms until adult life, when undue physical or nervous stress and strain or pregnancy will induce a profound digestive tract illness which is apparently dependent in some measure upon duodenal stasis. Gaseous indigestion was a chief complaint in sixteen cases. This term is used to embrace bloating, fullness, a sensation of discomfort, load or weight in the abdomen after meals or belching, rumbling and flatus.

Pain is a major complaint. It was encountered sixteen times. It was described as acute severe pain in the epigastrium, relieved by vomiting in three instances. The severity of pain was slight to moderate in thirteen cases. The pain is usually in the epigastrium or near the umbilicus. It was diffuse over the abdomen in two cases and in the right hypochrondrium in one case. The effect of posture on the pain in this condition is striking. Many patients obtained partial or complete relief by assuming the recumbent or knee chest position. The time of onset of pain is of significance. It is most frequently postprandial, and often quite late after eating. Relief from pain by eating was not uncommon.

The character of the symptoms in some cases can be better appreciated, when it is learned that thirty-five per cent of cases were provisionally diagnosed duodenal ulcer after the taking of the history. These patients complained of hunger pain late after meals, relieved by eating. Although the individual pain attack resembled duodenal ulcer, the definite periodicity so frequent in ulcer was absent.

Vomiting, considered a frequent symptom, occurred in nine cases. Duval et al describe two types of vomiting in duodenal ileus: (1) a painless, abundant projectile vomiting of fluid containing bile, which is seen in cases with an open or incompetent pylorus and a dilated atonic stomach. He refers to this variety as "overflow vomiting." We encountered three cases of this type. (2) Vomiting which occurs at the termination of, and affords relief from, an attack of pain. The pain is due to gradual distention of the duodenum, dependent upon the contents being held between a spastic competent pylorus and an occluded terminal duodenum. The stomach is not dilated in these cases with a competent spastic pylorus. Three cases belonged in this group and in three others the vomiting could not be classified with either group.

Toxic symptoms which are attributed to duodenal stasis are headed by headache or migraine. The latter constituted one of the chief complaints in forty per cent of our cases. This symptom was usually associated with nausea and vertigo and at times vomiting. Anorexia, malaise, neuralgia, exhaustion, fatigue and nervousness are frequently present. So-called biliary migraine was seen in several patients.

There was some disturbance of bowel function in sixteen cases. Twelve patients were constipated, two had diarrhea and two alternating attacks of constipation and diarrhea. Coloptosis, an undoubted etiologic factor in mesenteric occlusion of the duodenum, predisposes to constipation. Diarrhea or alternating diarrhea and constipation was present in the more advanced cases.

Many observers have mentioned the extreme state of undernutrition encountered in chronic duodenal occlusion, due to mesenteric pressure. Sixteen patients were underweight. The lowest weight encountered was sixty-eight pounds. Progressive loss of weight and strength over a comparatively short period brought up for consideration the possibility of malignancy in a few cases. The average weight in this series was one hundred and ten pounds.

Symptoms referable to the nervous system were very frequent. The periodic attacks of indigestion with marked loss of weight and strength were often associated with a so-called nervous breakdown.

Many of our cases gave a history of this type. During these periods mental depression and emotional instability may be striking. The state of malnutrition may be so marked in a few cases that the prognosis would appear grave. Partial obstruction, sitophobia and absorption of duodenal toxins probably play a part in the production of the extreme debility.

### PHYSICAL EXAMINATION

The asthenic habitus is the rule, normal habitus exceptional and the hypersthenic habitus practically never encountered. Seventeen of our cases were classified as congenital, asthenic splanchnoptotic types. The build was normal in three cases. Lordosis was pronounced in eight and the right kidney was definitely ptosed in seven cases and the left kidney in one. There were no examples of primary renal ptosis without associated ptosis of the other structures. Visible duodenal peristalsis and so-called duodenal splash have been observed in this condition. Gastric peristalsis may be visible. In sixty per cent of our cases the gastric succussion splash indicated a marked degree of ptosis or dilatation of the stomach.

In five cases tenderness of the abdominal wall of the type described by Carnett[22] made it difficult to ascertain the existence of visceral tenderness. In three cases deep tenderness was present over the duodenum, in the absence of parietal tenderness. The interpretation of deep tenderness in this region is difficult because of close proximity to the lateral aspect of the vertebrae which are often tender in lordotic subjects (Carnett). The abdominal musculature was of the wasted, thin scaphoid type, except in four cases.

The importance of the physical examination is the recognition of the asthenic habitus and the splanchnoptosia, the determination of ptosis of the individual organs and the elimination of other possible organic causes for duodenal dilatation. Hayes[23] suggested applying pressure over the abdomen below the umbilicus thus raising the mesentery and straightening the duodenojejunal angle. He states that this maneuver will bring about immediate relief from tympanites. We have not tested the accuracy of this sign during the acute exacerbation of pain, but such pressure was instrumental in alleviating abdominal discomfort in many cases.

### ROENTGEN-RAY STUDY

Without roentgen-ray confirmation the diagnosis of mesenteric occlusion as a cause of epigastric complaints in visceroptosis remains conjectural. The clinical status of the condition has always been, and must of necessity remain, entirely dependent upon visualization of the parts by roentgen-ray. The criteria for roentgen-ray diagnosis, which was fulfilled in our cases, is summarized by Duval et al as follows: (1) Dilatation of the proximal duodenum down to the midline. The dilatation may be absent and only a delay in the passage of the barium across the midline be seen. (In these cases the technic of Englebach should be tried. If dilatation cannot be demonstrated, the author feels that a definite diagnosis cannot be made). (2) Antiperistalsis and churning in the duodenum. (3) Disappearance of duodenal retention in the ventral position or by Hayes' maneuver. (4) The stomach may or may not participate in the dilatation.

Englebach recommended the following technic for the fluoroscopic examination of suspected cases: After locating the course of the duodenum by watching barium pass through it, the terminal duodenum is constricted by pressure of the left hand against it and the body of the vertebra. The duodenum is then filled by milking the antrum with the right hand, with the patient before the vertical fluoroscope. In mesenteric occlusion the duodenum presents a large, wide shadow throughout the first three portions, there being an absence of the normal markings of the cap and valvular conniventes. He mentions the difficulty of getting plates of the completely filled duodenum. As Wilkie has shown, the roentgen-ray findings are much more obvious during attacks and the duodenal dilatation best seen one and one-half hours after the meal. This emphasizes the importance of carrying out the technic of Englebach, if the patient is seen in an interim.

### CONCOMITANT ROENTGEN-RAY FINDINGS IN TWENTY CASES

a. Gastroptosis was extreme in thirteen cases and moderate in four. In thirteen cases the stomach was dilated as well as ptosed.

b. Dilatation of the duodenal cap, present in all cases, we consider an important finding. It can usually be demonstrated at any time, even in the interim between attacks, when the duodenal delay may not be obvious. The technic of Englebach should be carried out on every patient who has a dilated duodenal bulb. In many cases suspected of having ileus, duodenal ulcer must be ruled out. A large, dilated cap certainly militates against a diagnosis of ulcer, and favors "ileus."

c. Duodenal retention of the opaque meal was present after forty-eight hours in one case and after twenty-four hours in another. Unfortunately all cases were not studied at six hours, but a residue of barium was present at that time in six additional cases which were studied.

d. Ptosis of the right colon was present in fifteen of seventeen cases in which the colon was examined. Congenital anomalies in position of the colon were not noted in this series.

### GASTRODUODENAL TUBE STUDIES FOR DIAGNOSIS

In the rather extensive literature devoted to mesenteric occlusion of the duodenum very little mention is made of gastric or duodenal tube examinations. For this reason a report of observations on twenty cases is included.

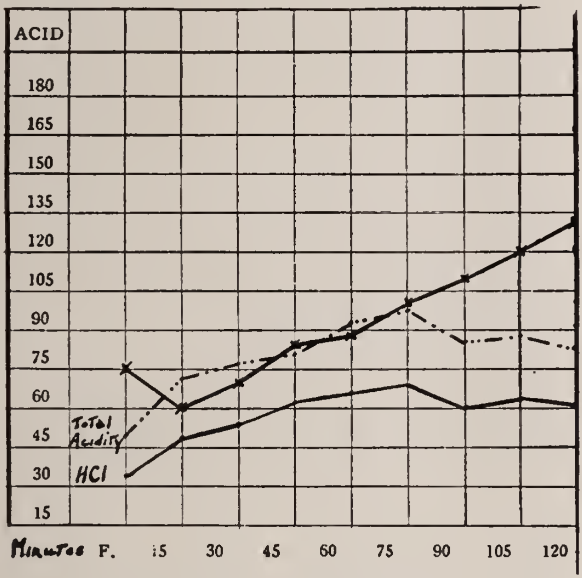

Fig. 1. Composite curve of hyperacid cases in duodenal ileus compared with duodenal ulcer.
—— free hydrochloric, duodenal ileus.
—··—·· total acidity, duodenal ileus.
×——× total acidity, duodenal ulcer, illustrating high terminal or so-called extragastric curve.

*Fractional gastric analysis.* The fasting gastric residuum was not as great in our cases as would be anticipated. The average amount of residuum was 20 c.c. Hyperacidity was present in nine cases. A composite curve of the hyperacid cases has been drawn (fig. 1). The curve does not resemble the type that is seen in duodenal ulcer. The extragastric curve of duodenal ulcer steadily rises until the completion of the test at two hours. The composite curve of "duodenal ileus" is of normal contour, with a definite trend downward in acidity, starting ninety minutes after the meal. There were five cases of normal acidity and six of hypochlorhydria. In three hypochlorhydric cases biliary regurgitation occurred throughout the period of gastric digestion. The reduced acidity may have been dependent upon dilution and neutralization by duodenal secretions in these cases.

The motor activity of the stomach was determined by measuring the quantity of food which was obtained by emptying the viscus two hours after the ingestion of the Ewald meal. Twelve cases had delayed stomach emptying. The delay was marked in four cases, practically no food being evacuated during two hours. Gastric motor delay was associated with hyperacidity in six cases. The delay occurred in five instances in the hypoacid group. In three of the latter cases the pylorus was incompetent, biliary regurgitation being present throughout the analysis. Hypermotility was present only once and that occurred in a hyperacid stomach. The gastric motor delay is very little more than one would anticipate in patients with gastroptosis without duodenal delay. Occult blood reactions on the gastric contents were consistently negative except in once case with a gastric ulcer.

The most interesting phenomenon is the tendency toward biliary regurgitation. It was pronounced in nine cases, in six of which bile was present in every fraction, both fasting and postprandial. An analysis of the bile regurgitation cases reveals the striking fact that every one was considered to have a dilated stomach by roentgen-ray examination. These cases belong in the pyloric incompetency group of Duval. Five of them gave a history of vomiting bile. In only one instance did the vomiting usually follow and relieve attacks of pain. In fifty-five per cent of cases there was no biliary regurgitation during the fractional gastric analysis.

In six of them the roentgen-ray examination did not reveal dilatation of the stomach. Four patients in the bile-free group complained of vomiting. This symptom followed and relieved attacks of severe abdominal pain in two cases. The latter probably belong in Duval's second group of vomiting associated with a spastic pylorus. Further confirmation of the competency of the pylorus was the absence of gastric dilatation. Constant biliary regurgitation during gastric digestion suggests pyloric incompetence. If it is found in association with chronic mesenteric occlusion of the duodenum, it points toward the existence of a concomitant gastric dilatation. Theoretically one would expect to see less severe pain in this group than in the type associated with a pylorus which fails to relax.

*Nonsurgical duodenal intubation* (*Lyon technic*). Of the fifteen cases studied, gross or miscroscopic food remains were aspirated from the duodenum (after a sixteen-hour fast) in five, or thirty-three per cent. The presence of food remains in the morning fasting duodenum is so rare that it at once suggests gross abnormality of duodenal function. The most common situation for duodenal pathology is in the cap. Disease in this situation, if obstructive in nature, does not permit of duodenal intubation. Consequently the finding of food particles in the fasting duodenum is practically always associated with disease below the cap. Gallbladder adhesions rarely constrict the terminal duodenum sufficiently to give rise to this finding. We have found fasting duodenal food remains in the condition under discussion, in duodenal diverticulum and in obstruction of the terminal duodenum by tuberculous glands, luetic glands and malignancy. In addition to food rests, such as meat and cellulose fibres, fat, starch cells and vegetable crystals, yeast cells were seen in two cases. Microscopic food was seen in the gastric residuum in two cases. The coexistence of catarrhal duodenitis is to be expected. In four cases epithelial cells, (probably representing exfoliation from the duodenum), pus cells, mucus and bacteria indicated a high grade duodenitis. A concomitant cholecystitis was suggested by the microscopy of the bile in three cases. Food rests in the fasting duodenum constitute the most valuable diagnostic aid second to roentgen rays, and will at times afford the first suspicion of duodenal stasis. Naturally it affords little information as to the cause of the stasis.

### BLOOD STUDIES

A slight to moderate secondary anemia was present in eight cases. The blood chemistry was normal except for a tendency toward alkalosis in one patient and a slight increase in uric acid and urea in the blood in three others. Duodenal obstruction is rarely constant for a sufficiently long period to cause alkalosis. If the latter condition is present, other causes of duodenal obstruction, usually organic should be sought.

### CONCOMITANT LESIONS

*Peptic Ulcer*. Sloan,[24] in analyzing a series of two hundred and sixty-four cases of duodenal ulcer, found an associated partial obstruction near the duodenojejunal flexure in fifty-two cases. He feels that partial obstruction near the terminal duodenum may cause or predispose to ulcer. In appropriate cases the removal of the partial obstruction without gastroenterostomy was sufficient to cure the ulcer. The obstruction in most of Sloan's cases was due to adhesions or bands. Barling, Lane, Deaver,[25] Duval and Zoeffel[26] have reported cases of peptic ulcer in association with duodenal ileus. Wilkie, in reporting a series of seventy-five cases of duodenal ileus, found an associated duodenal or gastric ulcer in nineteen cases (25 per cent). He also is of the opinion that duodenal ileus may be a predisposing cause of duodenal ulcer.

In our series of twenty cases there were two instances of ulcer, one duodenal and one gastric. Whether the ulcer is cause or effect is difficult to state. I have observed a case recently in which studies made five years ago revealed evidence of ulcer in the distal part of the cap without stasis in the lower duodenum. A recurrence of symptoms this year caused him to return. Studies more recently show the same ulcer defect, but in addition definite delay and dilatation of the duodenum distal to the ulcer down to the vertebral column. Intense antiperistalsis and writhing were noted. Is the stasis in this case secondary to the ulcer or has an intermittent mesenteric occlusion been present from the start, possibly predisposing toward ulcer? The patient had all the structural characteristics found in cases of mesenteric occlusion.

*Cholecystitis*. In Wilkie's series of seventy-five cases of ileus, four had cholecystitis. It is believed that the greater frequency of acute dilatation of the stomach after operation on the gallbladder may be due to acute dilatation developing in a case of chronic obstruction of the duodenum, which must predispose to infection in the biliary tract. Barling feels that duodenal stasis renders the biliary tract more liable to infection. In three of our cases a concomitant cholecystitis was suspected. Most surgeons familiar with mesenteric occlusion recommend an inspection of the terminal duodenum, when the upper abdomen is opened. This applies particularly to those cases operated upon for cholecystitis or ulcer when no pathology can be found, and more particularly if the patient is of visceroptotic habitus.

*Hemorrhagic pancreatitis*. Wilkie described a case of hemorrhagic pancreatitis in which at autopsy a great dilatation of the duodenum was present. He felt that the duodenal stasis may have favored the entrance of septic duodenal contents into the pancreatic duct with activation of the pancreatic enzymes. Sidel[27] and Brocq[28] working independently induced hemorrhagic pancreatitis in dogs with duodenal stasis. Brocq and others suspect duodenal stasis to be a more frequent cause of acute pancreatitis than is generally believed.

*Vicious cycle* after gastroesterostomy is atributed in some instances to mesenteric occlusion of the duodenum by Wilkie, Moynihan[29] and Reinhard[30].

*Duodenitis* obviously must be considered an accompaniment of duodenal dilatation due to mesenteric occlusion. Stasis of septic material in the duodenum for months and years must sooner or later bring about a chronic inflammatory change in the mucosa of that organ. Duodenitis is attracting more attention of late and is being reported from two distinct sources. Judd and others describe a localized duodenitis which mimics duodenal ulcer clinically, and may cause massive hemorrhage from the duodenum. Diagnosticians who utilize duodeno-biliary drainage report seeing many cases in which there is excessive flocculent debris, suggestive of a catarrhal affection of the duodenum. We mention these facts to suggest that mesenteric occlusion of the duodenum should be excluded in cases suspected of having a simple duodenitis.

*Neurogenic mucous colitis* was present in five of our cases. We feel that mucous colitis will frequently be found in association with mesenteric occlusion because the soil (the visceroptotic habitus) is often the same. It is of no special significance in this connection except that it will further complicate the clinical picture and cause additional disturbance of bowel function.

## DIAGNOSIS

*History.* The symptomatology cannot be consided pathognomonic in any sense. The onset of digestive disturbances in early childhood is frequent. Attacks occur without regularity and there may be a remission of symptoms for years. An attack with definite progression of symptoms and gradual loss of nutrition may occur in early adult life. Gaseous indigestion, nausea and vomiting, pain in the lower epigastrium, worse in the upright position, often benefited by assuming the recumbent posture, so-called bilious attacks with headache, vertigo and migraine, and constipation are the most frequent symptoms. A history of digestive disturbances can usually be elicited from the parent who is often of visceroptotic habitus. Duodenal mesenteric compression is much more frequent in the female.

*Physical examination.* The outstanding feature is the habitus, which is usually asthenic, the congenital type of Stiller more frequently. Lordosis, of course, is usually present as it is almost part and parcel of this habitus. Gastroptosis, a boggy right colon and a palpable right kidney are frequently found. Visible duodenal peristalsis and less frequently gastric peristalsis will be seen occasionally. There may be tenderness over the duodenum and very rarely a mass. The abdominal parietes are often tender. These patients are practically always underweight and appear undernourished.

*Roentgen-ray study.* Careful examination will usually make the diagnosis or at least cause one to suspect the condition. It is the most important diagnostic method. Without it a preoperative diagnosis is impossible.

*Fractional gastric analysis.* The following points are of note:

1. A tendency toward hyperacidity.
2. The gastric motor delay is commensurate with the asthenic habitus and not much increased by the presence of duodenal stasis.
3. Biliary regurgitation into the stomach throughout the period of gastric digestion in a visceroptotic patient warrants a suspicion of partial duodenal occlusion. The other common cause of continuous bile regurgitation is gallbladder disease which occurs much more frequently in the sthenic patient.

*Nonsurgical duodenal intubation.* Food remains in the morning fasting duodenum constitute the most valuable laboratory aid to diagnosis, second only to roentgen findings.

One might describe a hypothetical case as follows:

The patient is a married woman, age 35, who has had digestive troubles of a vague nature as long as she can remember. Indigestion occurred at long intervals during adolescence and early youth. She has had severe attacks of migraine, associated with nausea and occasionally vomiting every two or three months since childhood. Since the third pregnancy, three years ago, attacks of severe upper abdominal pain have occurred rather frequently. The pain is relieved somewhat by lying down, completely relieved by vomiting and at times by eating. Attacks often occur from two to four hours after meals or when tired or nervously upset. Headache, nausea and bloating are frequent and constipation quite marked. There has been considerable loss of weight and strength.

She is of congenital splanchnoptotic habitus with marked ptosis of the stomach and right kidney. The abdomen is scaphoid and the lumbar spine lordotic. Fractional gastric analysis reveals a moderate hyperacidity with slight motor delay and absence of occult blood. Biliary regurgitation was constant throughout the period of gastric digestion. Duodenal intubation revealed food rests in the fasting duodenum. Gastrointestinal roentgenograms show marked ptosis and dilatation of the stomach but no organic lesion. The cap fills well, is free from defect or irregularity and is enormously dilated. There is marked delay in the emptying of the duodenum which is enormously dilated

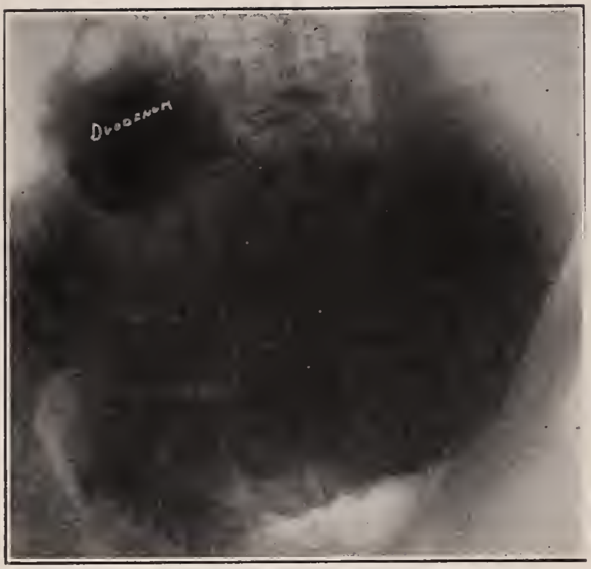

Fig. 2. H. S., female teacher, age 30. Spells of bilious headache with nausea and vomiting since childhood. For past year complained of epigastric pain one or more hours p.c., increasing in severity until the next meal. Relieved by lying down or knee-chest posture. Frequent severe attacks of acute pain, vomiting and diarrhea. Mental depression. Marked underweight. Loss of 36 pounds in 6 months. Loss of strength. Congenital asthenic habitus of Stiller. Bilateral renal ptosis. Lordosis. Abdominal parietes hypersensitive. Reduced gastric acidity. Bile regurgitation in every gastric fraction during analysis. Diagnosis: duodenal ileus and mucous colitis. Note extreme dilatation of cap and ptosis of stomach. Bed rest for 3 months was necessary.

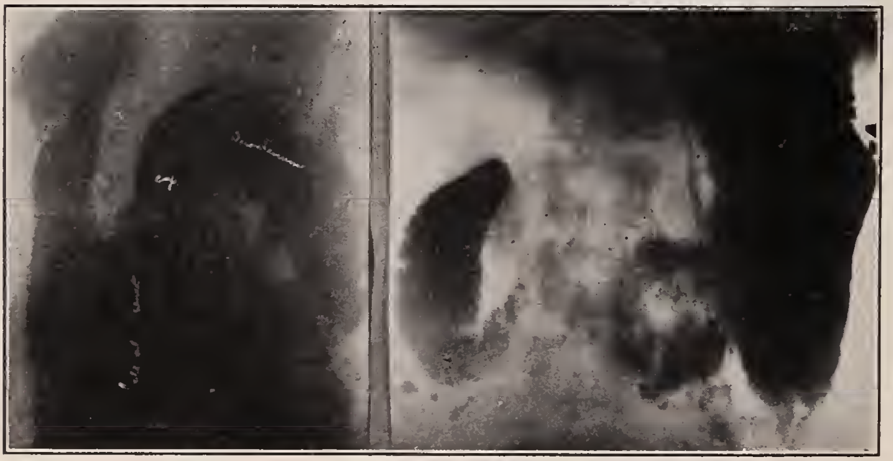

Fig. 3 Fig. 4

Fig. 3. M. L., female, age 38. Typical case of mesenteric occlusion of duodenum. This lateral view shows the enormous dilatation of the whole duodenum. The cap and second portion are evenly divided. Note the smooth outline. The stomach is extremely ptosed and atonic. The patient weighed 83 pounds and had had epigastric symptoms for 15 years.

Fig. 4. Same patient lying on back. Note extreme dilatation of whole duodenum proximal to the spine.

down to its spinal crossing. Six hours later the stomach is empty but the duodenum contains considerable barium. There is marked ptosis of the hepatic flexure and the cecum is in the true pelvis.

We feel with Wilkie and Barling and others that mesenteric occlusion of the duodenum should be considered a separate clinical entity, occurring in some cases of congenital splanchnoptosis. Its local manifestations are identical with those of any other condition which can partially or intermittently obstruct the duodenum at or near its termination (figs. 2-6).

## TREATMENT

Chronic mesenteric occlusion of the duodenum is in most instances but part and parcel of a generalized splanchnoptosia. In many cases it must be looked upon as a late development in extreme ptosis. The treatment must involve basically a regimen for the general visceroptosis and also include certain measures directed toward the local duodenal occlusion. The Kelloggs and Wilkie, surgeons experienced with duodenal occlusion, advise a thorough trial at medical treatment before recommending surgery. Because of the ptotic factor, every case must be treated medically. Even though the local condition requires immediate surgery, a medical follow-up will be essential for correction of the general ptosis and asthenia.

Wilkie recently stated that with his present knowledge many cases which he originally operated upon, he would now be content to treat medically. The cases whose symptoms were of a gaseous dyspeptic nature would be excluded. He would confine his surgery on this condition to those with excessive pain and vomiting obviously dependent upon obstuction. His best results were obtained when the roentgenogram was positive for duodenal dilatation and obstruction. His results were less certain when dilatation existed without obstruction.

*Medical regimen.* The first thing to be considered is whether an ambulatory or bed rest plan is to be adopted. Certain of the milder cases can be treated by the former plan. The majority will benefit by a preliminary period of treatment at rest in bed. The patient who is markedly undernourished with distressing local symptoms or evidence of toxemia will have to be hospitalized. The position in bed is of some importance. Lying on the back will continue the mesenteric pinch. Flat on the stomach or either side is a preferable position. Elevating the foot of the bed or the buttocks and thighs by pil-

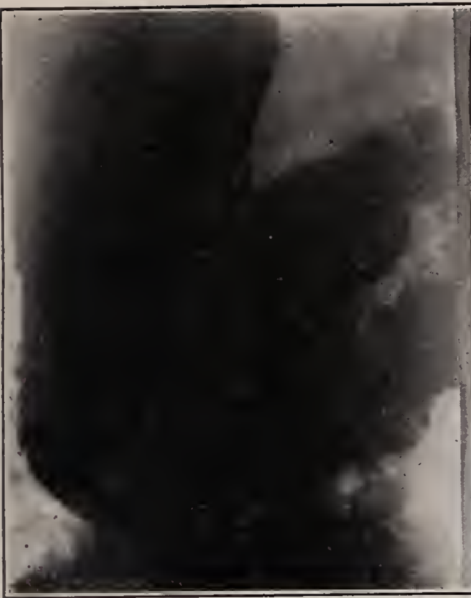

Fig. 5

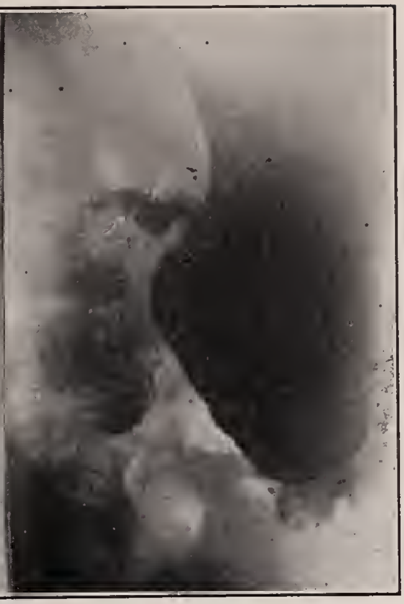

Fig. 6

Fig. 6. H. H. Asthenic, lordotic female with intermittent mesenteric occlusion of duodenum and duodenal ulcer. Note large subtraction defect in cap and dilatation of duodenum proximal to spine.

Fig. 6. H. H. Incisura-like defect in cap clearly shown in lateral view. Stasis in second and third parts of duodenum clear.

lows may help. In severe cases insistence upon absolute recumbency throughout the twenty-four hours for a long period may be essential.

When vomiting persists or local pain and discomfort are unrelieved several days after treatment has started, complete motor rest for the stomach and duodenum may be accomplished without loss of weight and strength by using peroral jejunal feedings. It is especially desired to stress the value of this measure in cases of this type. We have used the method in three cases of duodenal ileus and in many cases of gastroptosis with extreme asthenia and vomiting. The method is extremely easy to carry out without especial discomfort to the patient, providing nursing skill is available. The technic has previously been described.[31] Jejunal feeding may be continued over a period of two or three weeks. The period of absolute rest required will vary with the individual case. The mistake usually made is to allow the patient out of bed too quickly. Six weeks is an average minimum period. Many will have to remain in bed longer.

The diet is most important, the principles being a very high caloric, high vitamin, smooth diet, taken in small quantities frequently. Every effort should be made to avoid distention of the stomach. The required amount of nourishment to bring about consistent weight gain must be insisted upon. If there is over night gastric or duodenal retention, morning gastric lavage before any food is ingested will help to reduce digestive discomfort and assist in the accomplishment of a gain in weight. The ultimate goal in these cases is a substantial gain in weight. Everything else must be secondary to that. The results obtained are temporary unless a real gain in weight is secured and maintained.

Appropriate abdominal support must be worn in almost all patients and at all times when in the erect posture. If the patient is on a preliminary bed rest regimen, the support must be applied with the first assumption of the erect posture, which, of course, will be for very short intervals. The ambulatory patient should obtain an abdominal support at once. Care must be taken in the selection of a proper support for the individual and the physician should be sufficiently familiar with such supports to insure the patient's getting the maximum of benefit from the support. The abdominal belt cannot be discarded until the maximal weight gain has occurred and until the abdominal wall has been reeducated to function as a visceral support by appropriate exercise.

Postural measures are generally recommended and are of undoubted benefit. The ambulatory patient should be instructed to assume the recumbent posture, preferably not dorsal, for an hour or more after meals. A two-fold result is obtained. The patient is insured three hours rest during the day and the mesenteric drag is prevented immediately after ingestion of a meal. Assuming the knee chest posture for the relief of local discomfort of tympanites is of definite benefit in some. Wilkie is an advocate of the Goldthwaite diaphragmatic exercises in these cases. Ordinary exercises of the type usually recommended for strengthening the abdominal wall are indicated as soon as the strength of the patient warrants such measures. Abdominal massage during the period of bed rest seems to be beneficial.

Constipation is a frequent concomitant and must be handled by a sensible systematic regimen with avoidance of purgatives. Because of the duodenal occlusion, bulk must be forbidden but laxative foods are, of course, indicated.

Any hydro- or electrotherapeutic measure which tends to increase the tone and circulation of the patient may be tried unless there are individual contraindications. Tonics are indicated as a rule, otherwise medication will be directed toward individual needs. The outstanding therapeutic requirements are measures directed toward the treatment of ptosis and prevention of mesenteric traction. The same therapeutic doctrine which is being preached in diabetes and peptic ulcer applies just as forcibly in duodenal occlusion, i.e., the patient can practically never be discharged. Even when the ultimate result is achieved, he must report back to the physician at intervals to prevent recurrence of trouble and more specifically to guard against loss of weight.

*Surgical treatment.* In certain cases resort to surgery for correction of the mechanical obstruction will be necessary. Undoubtedly many of the cases which have been operated upon would have fared better without surgery. I believe that medical management should be tried even in the most extreme cases, as I have had several of this type do well after prolonged nonsurgical management. Surgery should never be undertaken in the presence of alkalosis. All such cases will require surgical treatment, however, after the alkalosis has been controlled.

Three types of operation have been devised: (1) short circuit operation or gastroenterostomy, (2) surgery directed toward the alleviation of drag on the mesentery from the right colon or right kidney, and (3) permanent drainage of the duodenum by duodenojejunostomy.

Various combinations of these three operations have been practiced. Gastroenterostomy alone is in disrepute, because results have not been good. It does not drain the static contents of the duodenum, nor correct the underlying condition. Duodenal toxemia may continue.

When ptosis of the right colon is considered to be the important etiologic factor, colon fixation is often advocated. In less severe cases the results reported have been good. McKenty considers suspension of the cecum most successful and does duodenojejunostomy only in the most severe cases. Right colectomy has been advocated by some but is generally and justifiably condemned. Fixation of the right kidney has been performed with indifferent results.

(To be continued)

# THE INJECTION TREATMENT OF VARICOSE VEINS*

A. Aldridge Matthews, M.D.
SPOKANE, WASH.

I have been much impressed with the injection method of treating varicose veins and have been using it for the past eighteen months. While my personal experience has been limited to a little over one hundred cases which is small compared to some, the literature on this subject in this country is rather meagre, this work being much more common in France and Germany. While De Takas of Chicago and McPheeters of Minneapolis are the most outstanding authorities here, I can find no mention of this method of treating varicose veins in our recent textbooks.

We are often asked the cause of varicose veins which may be presented as follows.

1. Primary failure of the valves of the internal saphena, no doubt, precedes its dilatation and is considered a cause, but this does not explain why the valves should fail.

2. Undue pressure in pelvic area due to pregnancy, fibroids, etc. Turner of London lays great stress upon obstruction at the oval window which is due to an anatomic structural deformity. Garters and other constructions must be considered.

3. Trauma. A number of patients will claim that their varicose veins developed after an injury.

4. Occupation. Those who work in a fixed standing position as barbers, streetcar motormen, laborers and the like.

5. Heredity. It is common to find several members of the same family suffering with this malady, and this suggests some endocrine insufficiency and perhaps later a cure along these lines may be devised as a means of treatment.

6. Compensatory enlargement of the superficial veins coming gradually on after a serious illness (typhoid, etc.), causing a thrombosis of the deep veins. This would contraindicate absolutely the injection of these veins.

It is rather remarkable to note in investigating these varicose vein patients, that many of them have their symptoms in their twenties and the majority in their thirties, while I believe it is generally thought of as a condition developing after middle life. It is more common in women by about fifteen per cent, and most probably this predominance is due to pregnancy and tumors in the pelvis. It is interesting to know that flat feet are often associated with varicose veins and it is estimated by various authors from twenty-five to fifty per cent.

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We are all aware of the nuisance and unsatisfactory results attending the use of elastic stockings and bandages. They will prevent further trouble to a certain extent, but they will never cure nor improve the condition. What we are aiming to do is to get a substance that is not injurious to the body when carried into the circulation, which does not cause coagulation of the blood with the consequent danger of embolism, and which is capable of producing a sufficient degree of inflammation of the vessel wall to cause an obliteration.

In diagnosing varicose veins, the circulation of the affected extremities must be tested. The pulsation of the femoral, popliteal, posterior tibial and dorsalis pedis are worth investigating, particularly in old people.

The state of venous circulation is tested by Trendelenburg's method. The patient's leg is well elevated, after which the varices empty. Next, the origin of the great saphenous vein below Poupart's ligament is compressed and the patient is asked to stand up. If the veins remain empty but fill up with a gush of blood from above when the compression is relieved, the test is positive for valvular incompetence of the great saphenous vein. If the veins fill up suddenly on standing, although the compression is still maintained, the anastomoses with the deep veins must be incompetent. If now the compression is relieved and the veins become still more prominent, the test is doubly positive for incompetence of both saphenous and anastomotic valves. Finally, if after compression the veins fill up slowly from below and do not dilate more after the pressure is relieved, the test is negative and the valves are competent.

Even more important, according to De Takas, is the test for patency and sucking action of the deep veins. If the patient stands up, his superficial veins visibly dilate. Next, a moderate amount of pressure (from thirty to fifty mm. of mercury) is thrown into a blood pressure cuff applied around the thigh. The pressure must only obliterate the superficial veins. The patient is now asked to walk to and fro in the room, during which time the varices diminish in size. When the pressure cuff is suddenly deflated, the veins fill up from above.

This test, first described by Perthes, demonstrates a flow from the superficial into the deep veins, into which the blood is sucked by muscular action. It is well understood that muscular exercise aids and promotes normal circulation in the lower extremities, yet too much significance must not be attached to this sign. If the patient is up and around with marked superficial varicosities and hardly any swelling of the ankle, or none at all is present, then the deep circulation is sufficient. The circulation in the superficial dilated system is reversed and out of commission anyway. If the deep veins are thrombosed and the superficial veins undergo a compensatory dilation, they should not be attacked.

Another easy and practical way of determining whether the deep veins are functioning is to place a snug fitting elastic bandage on patient's leg, tight enough to obliterate the superficial veins, and have him go out and walk about for twenty or thirty minutes. If this gives relief, it suffices to say that the deep circulation is all right and the superficial veins can be obliterated, but if the patient has pain or marked discomfort with blueness of foot, the superficial veins should not be interfered with, as it is a compensatory dilatation.

What we aim to do in this treatment is to set up an aseptic irritation of the vein, causing a complete obstruction which is accomplished by the caustic solution. This can be done without any special discomfort and no loss of time from one's occupation, while formerly it was a rather major operation, a general anesthesia, about ten days in the hospital and another two weeks getting back to normal, to say nothing of the extra danger which is associated with this surgical procedure. And the scars which are left after the operation are often unsightly, disfiguring and sometimes annoying.

The injection method of varicose veins was originated by Linser of Germany in 1912, and later popularized in France by Sicard. This method has gradually replaced the operation of varicotomy in these as well as other European countries in the face of considerable opposition on the part of conservative clinicians who feared pulmonary embolism, sloughing of tissue and sepsis.

It was noticed by Sicard[1] in the treatment of lues that the injection occasionally caused painless obliteration of the vein which led him to investigate and he found it to be due to the alkaline solution. Further experiments on varicose veins was carried out, showing it to be an ideal treatment for this condition.

In giving these injections it is necessary to possess a perfect technic. It is much more difficult than the ordinary intravenous injection on account of the contraction which often occurs in the veins.

Also, if the least bit of solution escapes into the tissue, a slough may develop.

Contrary to the opinion held by many that this injection is to coagulate the blood in the veins, it is an anatomic alteration brought about from the caustic injection. It is just an irritation of the endothelium and a proliferation with a gradual sclerosing and eventually an atrophy of the entire vessel.

A thin layer of fibrin is deposited which quickly adheres to the opposing layer and rapidly becomes organized, occluding the lumen and covering the length of the vein eventually into a fibrous cord. Especially is this the case, if a snug fitting bandage is applied and worn for three or four days, compressing the wall of the vein so it may adhere.

Sicard calls the reaction venitis which he states is different from the process of infectious irritation of the vein called phlebitis, and speaks of venitis as being localized, generating a very adhesive clot, does not give rise to pain or to general edema of the limb and leaves an atrophied cord. In phlebitis there is frequently an extension from the superficial network to the deep lying network, causing edema of the limb. The clot is often loose and afloat in the blood, there is pain, atrophy does not take place, the vein remains large and bulky and recurrent attacks are possible. Phlebitis may give rise to embolism, venitis has positively no tendency to do so.

This mode of cure appeals especially to the patient and most all that know about it would be relieved of this trouble rather than have the inconvenience and annoyance, to say nothing of the probable sequelae, for many are made invalids for years and are in constant distress and discomfort.

These patients need no special preparation but should be gone over thoroughly to see if any contraindications exist. The position in which the patients are when injections are given will have to vary. The most desirable is the lying position which permits the veins to collapse but they can usually be made prominent enough by the application of a tourniquet or sitting with the legs hanging over the end of the table. After entering the vein with the needles, elevate the leg to the horizontal position. On several occasions I have resorted to the standing position, letting the patient stand on a table or chair which facilitates the puncture of the vein. The objection to this is that the muscles are tense, veins are distended with blood which dilutes the injected fluid and, too, the likelihood of a patient fainting. So when this standing position is used, it should be done by a convenient couch or table so the patient may be placed in a recumbent position if necessary. Another advantage of the former position is that the muscles are relaxed, the veins containing little blood and the sclerosing solutions come in contact in greater concentration with the endothelium of the veins.

The point of entrance into the skin should be directly over the vein so that, if leakage does occur, it may have a direct line of exit. The valve action obtained by drawing the skin away from the site of entrance into the vein is not advisable and the danger of slough is greater. It is a good idea after entering a distended vein to push in the needle about two mm. to make sure its bevel is well in the cavity of the vein. After being certain the needle is properly placed, release tourniquet and place limb in position for injection. Be sure the needle is not misplaced in the manipulation by drawing in a little blood. The injection should be made slowly. It is well to reassure oneself that no mishap has occurred by drawing on the plunger of the syringe two or three times in the course of the injection to see if blood can be aspirated.

At the completion of the injection I make it a rule to draw a little blood up into the syringe and reinject to doubly satisfy myself that no solution was lost outside the vein. Withdraw needle and make gentle pressure for three or four minutes to insure against leakage through needle puncture. It is always wise to question the patient as to whether he is feeling pain while injecting, and if he does so, refrain from putting any more solution in at that particular spot, unless you can definitely prove to yourself you are in the vein.

I use a ten c.c. glass syringe with a 20-25 gauge short bevel needle. Larger needles are more difficult to get into the vein, and the possibility of leakage back of fluid and tearing the vein are greater. Also the bevel on these needles is longer, the larger the caliber.

If solution is lost outside the vein, I inject five c.c. of distilled water or normal salt solution immediately in this area, and gently massage. This will dilute and disseminate it. I make it a point whenever making these injections to have a diluting solution in the syringe at hand so it can be done immediately, rather than have it prepared after the accident has happened, preventing the sclerosed effect on the tissue. The solutions used according to Sicard, Forestier and Meisen have no coagulating action on the blood.

All veins do not act the same after an injection.

Occasionally one injection will do, especially if the veins are thin walled and small. Then, again, a stronger or different solution will have to be used if veins are large and thick walled. On one occasion I injected the same vein twice with twenty per cent solution sodium chloride, using each time ten c.c. and later used invertose comp. B.* before I got the desired results. This woman had a large varicosed ulcer and the veins were large and thick walled.

Certain areas should be avoided for injection, such as veins directly over the tibial bones, also over joints and the tendo achilles, because if we are unfortunate enough to get a slough, the damage may be very great.

Complications of varicose veins are ulcers, superficial phlebitis, and the various manifestations of impaired nutrition of the skin in the form of eczema and hyperkeratosis, and sometimes of the bone as a pereostitis. They may have no connection whatever with the deep thrombophlebitis occurring after childbirth, pelvic operations or typhoid. The deep thrombophlebitis may also lead to ulcers, and the differentiation between varicose ulcers and a thrombophlebitis ulcer is important.

Varicose ulcers occur in the presence of preexisting voricose veins after slight injury with possible superimposed infection. The wound does not heal because of poor nutrition, becomes chronic and may occasionally flare up and start a phlebitis of the superficial veins. In deep thrombophlebitis the most common site for ulcer is a few finger breadths above the inner or outer ankle, where it is very resistant to treatmnt.

Immediately following the injection these patients have rather severe cramping which usually involves the whole leg and lasts for about a minute, then disappears entirely, but this varies, depending upon the solution used. I have seen a vein contract from six to eight inches, making a trough depression on the skin surface immediately following injection. From two to three days following the injection the course of the vein becomes sensitive and can be felt as a distinct cord, due to the sclerosing reaction. A snugly fitting A.C.E. bandage should be worn for several days following the injection.

I have a personal feeling that the occurrence of pulmonary embolism from varicose veins of the legs has been much overestimated in the past. As I think back I do not recall a single case following a case of phlebitis of the legs. In these embolic cases, as a rule, the thrombi apparently originate elsewhere and not as a rule in at least the superficial veins of the leg, and, too, it has been shown in these varicosed veins the circulation is very sluggish and even reversed, but it must be still considered a potential forerunner of pulmonary embolism.

It has been shown by using a strontium bromide solution as an injection and the roentgen rays, that the fluid will follow in the opposite course of the blood stream. For this reason we get our sclerosed condition of the vein lower down than where the injection is given. The specific gravity of the fluid used might also have something to do with this as well as the poor and reversed circulation.

Sicard and Gaugier[2] injected iodized oil into varicose veins under the fluoroscopic screen and found the flow, if not reversed, was much slower, and the liquid injected in the superficial network of the veins did not show any tendency to reach down to the deep seated network, when the injection had been made on the recumbent patient, the leg being at rest in its usual posture. But as soon as the patient is asked to perform active muscular movement of the leg, it is possible by means of the roentgen ray to see suction take place from the surface toward the deep vein and the opaque liquid injected into the superficial network penetrating into deep lying veins.

The theoretical objection that has been raised against the injection treatment of varicose veins is the possibility of embolus, secondary to thrombosis. Dr. E. T. Bell, professor of pathology, University of Minnesota, with reference to this possibility of embolism, says, "Regardless of how much experimental work might be done, it would be impossible to rule out the everpresent theoretical possibility of the danger of embolism with fatal termination, but in view of the fact of the large number of cases injected both at home and abroad, I feel that the practical clinical evidence of thousands of injections having been made with but one fatality from embolism would be more than sufficient to outweigh the everpresent theoretical danger."

A histologic study of such thrombi shows a very active process of organization, fibroblasts and newly formed capillaries entering the thrombus at right angles from the injured intima. The difference between such a thrombus following a physicochemical injury, and a static intravenal thrombus taken from an iliac vein is very striking, in that the static thrombus hardly shows any roots or fibroblasts and no capillaries emerging from the vessel wall but they simply adhere to the wall by cohesion (De Takats).

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* This is a stable solution of invert sugar fortified by sodium salicylate, sixty per cent solution of the former and ten per cent of the latter.

A new era in the cure of varicose ulcers has been opened by the injection method. Old chronic ulcers that are resistant to treatment, and others that are constantly breaking down can be permanently cured, if the veins in connection with them are obliterated. The injection of these should be combined with stimulating and supportive treatment to the ulcer, such as the Unger boot, etc.

Many different solutions have been used for the obliteration of varicosed veins but the most dangerous ones have been eliminated. Calorose, mercuric iodide, urethrane and quinine hydrochloride, glucose sodium chloride, sodium salicylate, or some combination of the latter three are among the ones which are most used. The last three are the most popular and generally used. McKim[3] claims the choice for every day use of the solutions are in the following order: sodium chloride, invert sugar, sodium salicylate, mercury and metaphen.

Linser, first using one per cent mercuric chloride but later twenty per cent sodium chloride solution, reported more than six thousand injections. The French school under the leadership of Sicard has been using sodium salicylate in 20 per cent and 40 per cent solutions. Noble has made injections of 50 per cent dextrose in as many as 3000 patients, and has been recently using calorose, a mixture containing equal parts of dextrose and levulose with 4 per cent sucrose. Meisen used equal parts of 25 per cent sodium salicylate and 10 per cent sodium chloride.

When first starting this work I used 20 per cent sodium chloride with splendid satisfaction, as it is perfectly safe with few if any contraindications, the only danger being spilling of the solution outside of the vein which would cause a slough. The safety of the sugar solutions as injections has done away with the danger of slough, if the solution is injected by mistake outside of the vein, and to an extent is supplanting the hypertonic or chemically highly irritant substances. The cramping immediately following the injection does not occur with the sugar preparation unless some of the chemical substances are added to it.

I am still using the sodium chloride 20 per cent solution, injecting 10 c.c. I have used as much as 20 c.c. when injecting both legs, but rather prefer the glucose solution. The one that I generally use is the invotose compound "B." As this preparation contains 10 per cent sodium salicylate, I would not advise more than 10 c.c. being used at any one time for fear of an idiosyncrasy to that drug. On a number of occasions I have, when patients have varicosed veins in both legs, injected one with sodium chloride and the other with invotose compound. As a whole I have gotten better results from the latter.

Recently I have been using urethane with quinine hydrochloride and find it also very satisfactory, being especially good where the veins are small for here the ordinary hypodermic and small needle can be used, doing away with one objection to the glucose solutions in that they are quite heavy, being concentrated, and a much smaller quantity of the former solution is used. Also this solution can be injected into the large clusters of small veins that are seen at various areas of the leg in which there is no large vein accessible. These are found especially just below the knee on the inner side. It acts much the same as it does in hemorrhoids. Also they are useful in the treatment of the cutaneous dilatation of capillaries so disfiguring to some women's thighs which are spoken of as "stars," "brushes," "skyrockets" or "spider bursts." I have personally never used more than 2 c.c. of this solution at one injection.*

According to Kern and Angle,[4] "after considerable experimenting we found that equal parts of dextrose 50 per cent and sodium chloride 30 per cent, when used as a mixture, made an ideal solution. When injected into the abdominal wall of a dog intradermally (in not too large amounts), subcutaneously or intramuscularly, no slough resulted. There were only slight local reactions, and the formation of a hard mass was slowly absorbed. Experimentally and clinically it causes an endophlebitis equal to that of the salt solution. Either solution alone will cause a destruction of the endothelial lining of the vein, but why the mixture should destroy the intima when injected into the vein and not the cells outside is difficult to explain on any basis other than a mechanical one. Clinically, if the solution escapes while an injection is being done, the patient complains of burning which is moderately severe and leaves an area which becomes painful, red and very tender to the touch but has never sloughed."

The risk of excision compared with injection is much in favor of injection. Brentsin[5] reported 7.2 per cent of embolism after operation. In most of these embolic cases the infarcts were survived, making a mortality of .7 per cent, this being in a series of 376 cases. McPheeters[5] reported a collection of 7000 operations on varicose veins with sixteen deaths from pulmonary embolism, a percentage of one death from embolism per 500 operations performed. A series of cases treated by the injection method by Luser 6000, Sicard 3000, Noble 3000 and Meisen 2000, combined making 14,000 without a fatal case of embolism, show what a wonderfully safe procedure it is.

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* The solution, prepared by Parke, Davis & Company, is quinine hydrochloride .266 grams and urethane .133 grams, made in ampules of 2 c.c. size.

Brentsin[7] found no improvement in 20 per cent of his cases operated upon in a series of 351 with two deaths from embolism. Jeannel[8] in a series of 1019 patients only obtained a cure in 33 per cent of cases operated upon. Koracs[9] in a series of 14,000 showed a failure of cures in 30 per cent after operation.

After the injection method the percentage of recurrences is much less. Kilborne[10] reports from communications from a number of men according to Sicard. In 15,000 cases recurrence occurred at the site of the injection in none and new varices at other sites in 4 per cent.

Linser reports from 5 to 7 per cent not improved after injection in a series of 15,000 after three-year period. Delater, in a series of 890 cases after a period of thre years, had recurrences in 5 per cent. Noble reported that in one-fifth of 3900 cases followed for three years or more, there was no improvement in from 5 to 7 per cent. In a published article of Foristier[9] the highest rate of recurrence was 15 per cent, the average being nearly 6 per cent. The proportion of recurrence or appearance of new varicosities after injection is, therefore, only one-sixth as great as after excision with a great lessening of the risk incurred by repeated operations.

Kilborne in his summary of 4607 cases shows positively that the mortality of excision of varicose veins is one in 250. The mortality by injection cannot so accurately be determined, but a study in about 50,000 shows that it is less than one in 4000. Recurrences after operation average 30 per cent and after injection 6 per cent.

McPheeters and Rice reported 53,000 collected cases treated by the injection method with only four fatalities due to pulmonary embolism, or mortality of 0.00754 per cent, and claims the operative mortality to be fifty-three one hundredths per cent.

### CONTRAINDICATIONS

1. Diabetes. In such cases the reaction is more severe and the danger of slough is greater, although Sicard does not consider diabetes a contraindication. Sugar solutions should not be used.

2. Pregnancy and pelvic tumors. In these cases the treatment should not be undertaken until several months after labor, or after the operation for the tumors.

3. Acute inflammatory condition of the pelvic organs.

4. Acute or subacute phlebitis should not be treated by this method until all evidence of inflammation has subsided, as these cases are very dangerous and are the most frequent cause of emboli.

5. Arterial circulatory disturbances of the lower extremities in men. No man should be injected until one is absolutely positive that the pulses in both feet are present and normal.

6. Severe organic diseases, such as pathologic heart and kidney conditions. These cases are best treated conservatively.

I agree with McPheeters who states that the injection method has passed the experimental stage and has proved to be a great rational form of treatment which should be accepted as supplanting other well recognized methods of therapy.

### CONCLUSIONS

1. It is the safest treatment. There is no danger from emboli and anesthetic.

2. There is no disfiguration.

3. Economically there is no loss of time and earning capacity.

4. Results are permanent in much over ninety per cent.

I wish to acknowledge the splendid articles on this subject by De Takats and McPheeters, whom on several occasions in this article I have quoted.

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# TREATMENT OF VARICOSE VEINS*

Lester L. Long, B.S., M.D., F.A.C.S.
SEATTLE, WASH.

In view of former intimate acquaintance and some familiarity with the present methods of both Drs. H. O. McPheeters of Minneapolis and Geza de Takats of Chicago, who are probably the two foremost advocates in this country of the obliteration of varicosed veins by injections therein of sclerosing solutions, it is my belief that a rather brief but practical discussion of this treatment may prove both interesting and beneficial.

## ANATOMY

Veins which are varicosed may be located in any portion of the body, but by common usage the term "varicosed veins" has come to designate the enlargement and tortuosity of the superficial system in the lower limb, the large and small saphenous veins. The large, extending upwards from the mesial aspect of the ankle to knee and continuing on mesial aspect of thigh, enters the femoral vein just below Poupart's ligament; the small extends from external aspect of ankle upwards posteriorly into popliteal vein behind the knee. These veins have little supportive surrounding tissue except adipose and skin, which latter tends to relax after middle life as do the muscle and elastic fibres in the vein walls themselves. Many communicating veins connect both of these superficial veins at frequent intervals with the deep system which is surrounded by the heavy muscles of the leg, which tend to massage this deep system during motion. This fact, combined with the aspiration of cardiac action and negative intraabdominal pressure on expiration, normally returns the blood quickly from the lower limbs to the heart.

## ETIOLOGY

Frequently, however, due to type of occupation, constipation, severe and chronic coughs, pregnancy, some other increased intraabdominal pressure or some circular constriction around the limb, this return flow becomes impeded. Also loss of tone and support of the tissues may be noted elsewhere in the patient, as for example, visceroptosis, varicocele, varicosities in broad ligaments, hemorrhoids, etc., signifying a general relaxation. With the consequent collection of excess amount of blood in these weakened veins they are noted to engorge and become tortuous. Also, should this blood tend to carry any even low-grade infection, on account of this stagnation above the valves an inflammation and further weakening of the walls at this point is possible and has been demonstrated microscopically.

With continuation of such engorgement and possibly some infection, the valves in these superficial veins gradually cease to function and atrophy of elastic and muscle fibres in the vein wall itself may be demonstrated, so that an actual reverse flow in the blood stream here takes place. The communicating veins, however, will for a time care for this condition, but as the progress continues their valves too gradually cease to function. Recognizing these facts, the positive statement can be made that the flow of blood in varicosities of the superficial system, so long as the deep system is functioning properly, is always stagnant or reversed, and thus a chemically produced thrombus within such a varicosed superficial vein will either remain stationary. or be forced distally into smaller lumened vessels and rarely if ever will an embolus become loose into the general blood stream. This fact has been proven very convincingly by lipiodol injections of such veins and roentgen-ray, fluoroscopic and photographic evidence obtained.

Without treatment such stagnation and reverse flow of the blood will shortly saturate with serum the tissues supplied by these veins. Their resistance to trauma or infection will be markedly lowered and in advanced cases actually swollen and "waterlogged," and still further neglect on the part of the patient allows development of the complications of varicose veins, such as thrombophlebitis, eczema and varicose ulcers, some mention of which will be made later.

## DIAGNOSIS

The diagnosis of varicose veins and their complications, if present, is evident on even casual inspection, but classification and decision as to treatment is considerably more difficult. Proper function of the arterial system in the limb must be determined by pulsations, lest a thromboangiitis obliterans be in progress; and also proper function of the deep system of veins must be proven, lest these evident varicosities in the superficial system be compensatory ones for a pathologic blocking of that deep system by some former thrombophlebitis present there. These two points are most essential and must never be neglected. The examiner should be familiar also with the tests of Trendelenburg for the function of the saphenous veins and their valves and that of Von Perth for the proper function of the deep veins.

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* Read before King County Medical Society, Seattle, Wash., Oct. 21, 1929.

The Trendelenburg requires that the leg be markedly elevated and the varices emptied. By palpation the saphenofemoral junction is located just below Poupart's ligament and pressure applied to the uppper end of the saphenous vein at that point and patient is allowed to stand. If the vein fills slowly from below and not more so when the pressure is released, then the test is nil and all valves are competent. If, however, the veins remain empty until the pressure is released and then fill with a rush from above, the test is positive, for the valves of the saphenous vein are incompetent. Further, if with the same process, the veins fill promptly when the patient stands, though the pressure be continued, and then engorge still more when the pressure is relieved, we say the test is doubly positive and the valves of both the saphenous and communicating veins are incompetent.

In addition to this the Von Perth's test requires that as the patient stands with veins engorged, a blood pressure cuff with sufficient pressure to block superficial system only is placed around the upper portion of the thigh. The patient is now instructed to walk about and, if the varices diminish but promptly engorge again on release of the slight constriction, the test is positive for incompetent valves but the deep system is proven as efficient.

### TREATMENT

If by these measures we are satisfied that only faulty structure of the superficial and communicating veins and their valves is present, and the deep system functions properly, treatment is to be instituted.

1. *Palliative* or temporary measures are in order, such as treatment of any persistent cough, constipation, etc., application of maternity abdominal supports if necessary, removal of any pelvic tumors or any constrictions around the limb and application of mild support externally to the entire limb by the age-old custom of pliable bandages.

2. *Operative.* Formerly it was the rule to institute operative procedure and the patient to spend about ten days to two weeks in the hospital and at least a month from active work. The majority of operators are familiar with the operations of Trendelenburg for ligation at upper end of the large saphenous and resection of a portion; of Schede for multiple circular incisions through veins, lymphatics, and all tissues down to the deep fascia; of the Mayo stripper, block dissection, Babcock's probe inversion and removal of these veins, etc. All of these procedures required hospitalization and incapacitation from work, extensive scarring, rather high mortality, much edema of extremity from lymphatic destruction, and frequent recurrences especially after a five year period.

Kilbourne of Los Angeles is responsible for the positive statement that "in America a survey of over four and one-half thousand operated varicose veins gave a mortality of one in 250 and recurrences averaged 30 per cent, while by the injection method, in over 50,000 cases there was a mortality of only one in 4000 and recurrences in only 6 per cent."

3. *Injection advantages.* The advantages to the patient, therefore, of the injection treatment are truly very many, in that they may remain ambulatory under office care and away from work but little if any, and obtain results which I am convinced are more satisfactory and with less risk.

Contraindications are very few, namely, acute thrombophlebitis of either deep or superficial systems, former or chronic involvement of the deep system or impairment of function of the arterial supply. Diabetes is no contraindication (for a solution may be employed which will in no way affect this disease), except that a subsequent true diabetic gangrene of toes or foot might be wrongly credited to the treatment. Pregnancy is no contraindication except that the varicosities are bound to be less after delivery and, unless they cause too severe distress, should be left for later treatment. Cardiorenal decompensation cases would require especial study but are not to be considered per se as contraindications.

Having decided that treatment is necessary and determined the feasibility of this injection method, the selection of a sclerosing solution is essential. I use the word sclerosing emphatically, for no longer is it considered wise to use a solution intentionally to coagulate the blood within the vein. In coagulant solutions lie the danger of emboli, should some of this material mix with blood cells in the general blood stream. This is not true, however, where the solution itself will not coagulate the blood at all, and only when in a concentrated solution will it so destroy the intima of the vein that a firm, strong thrombus is formed within and anchored to that particular portion of vein wall. It is therefore wise, though many various solutions have been advocated for this treatment, to confine our selection to the following: Sodium salicylate 20 to 60 per cent, sodium chloride 15 to 30 per cent, dextrose 50 per cent, and the other sugar solutions such as calorose and invertose, or combinations of these various solutions. Of these latter combinations, there are advocates for each, as for example:

1. Meisen's mixture which is equal parts of 25 per cent sodium salicylate and 10 per cent sodium chloride.

2. Invertose compound which is invert sugar plus sodium salicylate.

3. That of Kern and Angle of Baltimore which is equal parts of 50 per cent dextrose and 30 per cent sodium chloride.

The latter seems to me to be most logical in that it is well recognized that the solutions of sodium salicylate and sodium chloride do easily and well obliterate the veins but cramps and local reactions are frequently severe, while on the other hand, the 50 per cent dextrose is very bland, not so irritating either within or outside of the vein and thus not so effective and less efficient as an obliterant. There is danger of slough formation, if through error in technic any of these solutions be injected into the tissues outside of the vein itself.

The technic of injection is by no means complicated but should be thoroughly understood before attempted, lest disastrous, painful, endangering and most uncomplimentary results follow. The following rules are, therefore, dogmatic:

1. First and foremost, asepsis must be absolute, for any infection carried into these pools of stagnant blood by the injection may promptly produce an acute thrombophlebitis. Therefore, the solution, syringe and needle must be absolutely sterile and the skin at sites of puncture thoroughly cleansed and treated freshly with iodine or mercurochrome.

2. The patient and the operator must be in the most comfortable position obtainable to insure accurate injection and control of administration. For this purpose, the prone, sitting or standing position of the patient, the lowering of the leg for insertion of needle into vein and then elevation of leg to empty the vein, the use of tourniquets above and below point of injection or the simple pressure of opposing fingers of operators left hand, the amount of solution per injection and the number of sites injected at one sitting are all individual peculiarities with different operators and must be worked out as such. A fair average is from 5 to 10 c.c. per injection, two to three injections at one sitting and at two to three day intervals.

3. The needle must be wholly and absolutely within the vein itself at all times during the injection and this to be visibly proven at intervals by aspiration of blood into the syringe. For this, most accurate control is to be obtained by use of a syringe with finger-ring grips on both plunger and barrel. Injection must be stopped at once, if there is any suspicion that solution is not wholly within the vein and the entire area is to be at once freely infiltrated with normal saline solution.

4. The vein under treatment must be as nearly empty as is possible at time of injection for the more concentrated is the solution, the more certain is successful obliteration of the vein.

5. Quick removal of the needle and immediate application of pressure over the vein by a pad of gauze held in place by adhesive strips is essential to prevent leakage of the solution.

6. It is good treatment to elevate the leg after about ten minutes to drain off any superfluous solution and to bandage the entire limb, including the pressure pads previously applied, with light elastic bandage, and the patient is then to walk about as usual. I should also advocate that, if the limb under treatment has many and very large varicosities above the knee, under local anesthetic a small incision be made through the skin just below the saphenofemoral opening, and a double ligation of the uppermost inch of the great saphenous vein be done. This will hasten the treatment considerably, I am satisfied. It is important that any ligation be done in the uppermost first inch of the great saphenous, for it branches very quickly downward.

4. Subsequent care. During or immediately following the injection any sharp, burning pain at immediate site is to be interpreted as evidence that some solution is outside of the vein, and care should be given at once. But some cramp-like distress in the limb and even some twitching of the muscles, especially around the ankle and small part of calf of the leg, is to be anticipated and patient so forewarned. Walking exercise is advocated rather than rest. Local heat and some analgesic tablets may aid in return to normal. Some swelling of the limb may be noted and the supporting bandage may be removed after twelve hours, but if limb be uncomfortable, it must be immediately reapplied. On the day following the injection the patient should be examined and carefully watched for one or two weeks and instructed to report at subsequent intervals to treat any minor veins not entirely obliterated, and to permanently record results, etc. Should, unfortunately, due to faulty technic, sufficient of the solution have escaped into surrounding tissues to produce an actual slough, this should be excised in a most aseptic,

surgical manner and closed at once, attempting healing by first intention.

5. Complications. Brief mention should be made of those neglected cases which frequently come under observation. Eczemas and ulcers require immediate cleansing of their surfaces and support to the entire limb with especial rubber sponge pressure over the ulcer, and as early injection of the offending and causative varicose veins as may be done in thoroughly aseptic manner. The tight pressure bandaging of these limbs is most essential, even if painful for the first few hours, and the patient should be up and walking about rather than lying down. In this cleansing and firm support and early injection of the veins lie the success of their treatment. When large ulcer surfaces have been cleansed properly, skin grafts may then be employed to hasten the cure. Long continued support to the entire limb by Unna's casts or some such agent is absolutely necessary for these old advanced cases.

In acute thrombophlebitis of the deep system of veins rest in bed, elevation of limb and application of ice is imperative, but this is not true in the acute thrombophlebitis of the superficial veins. Here pressure bandaging of the entire limb with rubber sponge over site of infection, though painful and often distressing to the patient as he is forced to keep walking about the majority of the time, is best treatment, and in four to six weeks after all inflammation has subsided, the offending veins should be obliterated by injection.

### SUMMARY

In true superficial, varicose veins, ones not compensatory for impaired function of the deep venous system or arterial supply, the flow of blood is always nil or reversed.

The injection into these veins of solutions which will not coagulate blood cells, but will destroy the intima of these vessels and so obliterate them by a firm thrombus anchored at that point, any portions of which would travel distally to smaller vessels should it become loose, is a most logical treatment.

By the obliteration of these veins, the circulation of the dependent limbs is returned toward the normal and consequently those tissues which were supersaturated with blood serum become more resistant, more viable and more healthy. The morbidity and mortality, the incapacitation and the recurrences are certainly much less by the injection treatment than by operative interference.

Medical-Dental Bldg.

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# RELIEF OF PAIN FROM A NEUROLOGIC VIEWPOINT*

P. G. Flothow, M.D.
SEATTLE, WASH.

I shall not go into the psychic elements of pain except to state that undoubtedly psychic influences play a great part in its determination. A certain stimulus in one individual may cause a great deal of pain, whereas the same stimulus in another may give rise to no painful sensation. There is undoubtedly a threshold variation in the determination of a painful stimulus which varies with the individual.

A few words on the anatomic and physiologic aspects of pain are apropos. The anatomic unit of the nervous system is the neuron. An external painful stimulus in reaching the sensory cortex traverses at least three neurons. Take for example, pain sensation in a spinal nerve. Nerve cells for the neuron are located in the ganglion of the posterior root. The lower neuron enters the spinal cord by way of the posterior root and forms a synapse with a cell in the posterior horn. From here it crosses in the middle of the cord and enters the spinothalmic tract in the anterolateral column of the cord. This tract also carries the temperature sensibility. The anatomic location of the spinothalmic tract in the anterolateral columns of the cord makes it amenable to surgical section. This point will be discussed later.

The tract ascends in the cord and reaches the optic thalamus, where it synapses with the cell of the third neuron which passes through the posterior portion of the capsule and up to end in the sensory cortex in the postrolandic area. Foerster[1] has shown that some sensory fibers enter the cord by way of the anterior roots through the sympathetic system. This question of sensory paths for pain is far from settled. I have performed rhizotomy of the posterior roots and still have been able to produce pain in the area supplied by the nerves sectioned. If it is true that some pain sensation is carried by sympathetics, a number of puzzling phenomena can be explained.

When we take up the subject of visceral pain we are struck by the fact that this type of pain is transmitted through sympathetic pathways. The only two conditions producing visceral pain are overdistention and overcontraction, both of which act through the parasympathetic nerves.

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* From the Neurosurgical Clinic, 902 Boren Avenue.

Anatomically, then, we have theoretically four points of attack on pain as transmitted along a spinal nerve:

1. The peripheral portion as far as the spinal cord.
2. The nerve roots in the spinal canal either extradural or intradural.
3. The spinothalmic tract in the spinal cord.
4. The central tracts to the cortex.

Practically the first three only can be considered because obviously with our present knowledge and limitations we cannot attack the centers.

The simplest way to present this subject is to start at the head and proceed downward. I wish to bring up a few painful conditions which are often neglected but in which very definite measures for relief of pain may be taken.

### MIGRAINE OR HEMICRANIA

This condition is very familiar to all of you and requires no elaboration. The treatment is so varied and so many remedies are used that we can be quite sure that none of them are of much value. I merely wish to mention here the use of trethylene or trichlorethylene which was first used for trifacial neuralgia, under which subject I will discuss it more fully. In some cases of migraine this drug has remarkable efficacy.

### TRIFACIAL NEURALGIA

This affliction causes some of the most distressing pains to which humans are subjected. The sufferer from trifacial neuralgia or tic douloureux is among the most to be pitied of individuals. The pain is a terrific burning, boring one that drives the sufferer to distraction. It may involve any or all of the three divisions of the trifacial nerve. It is usually unilateral, although in a small percentage of cases it is bilateral. The lower two divisions are most commonly affected. There are usually one or more "trigger areas," stimulation of which brings on paroxysms of pain. Chewing, talking, coughing and sneezing frequently bring on the pain. Fortunately the paroxysms last only a few seconds to a minute as a rule, but they frequently progress to the point where they come so often as to be almost continuous and when this occurs the sufferer frequently destroys himself or takes to narcotics in large doses.

There are three methods of treating this disease: (1) Alcoholic injection, (2) peripheral avulsion of the branches, (3) section of the sensory roots of the gasserian ganglion.

Alcoholic injection gives very good temporary results in about 50 per cent of cases, relief lasting from three months to two years, averaging about nine months, when the pain recurs. The second and third branches are not difficult of approach and 2 to 5 c.c. of 80 per cent alcohol may be injected, usually without any complications (fig. 1).

It is usually wise to practice preliminary alcoholic injection to accustom the patient to the numbness which follows operation. Peripheral avulsion of the divisions of the nerve is just about as effective as the alcoholic injection and gives relief for about the same length of time. Personally we prefer the injection because it is simpler and really more effective as it can be repeated indefinitely if necessary. At present it is my practice to use avulsion only where the supraorbital division alone is involved as, owing to the proximity of the eye, alcoholic injection is difficult and not very effective.

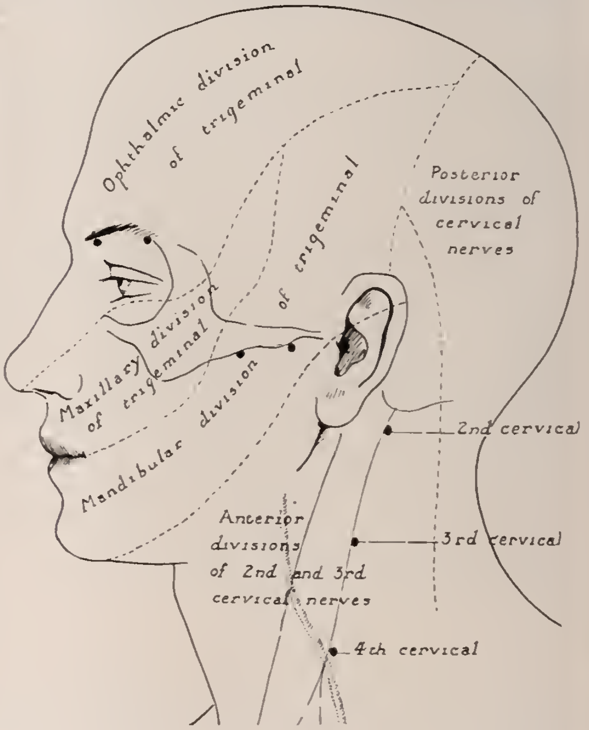
Ophthalmic division of trigeminal
Posterior divisions of cervical nerves
of trigeminal
Maxillary division of trigeminal
Mandibular division
2nd cervical
Anterior divisions of 2nd and 3rd cervical nerves
3rd cervical
4th cervical

Fig. 1. Shows points of injection of the trifacial and cervical nerves.

The original major operation consisted in a removal of the ganglion. This was followed by such a high percentage of corneal ulcers, which necessitated removal of the eye, that Frazier[2] developed an operation which took only the second and third divisions. Adson[3] has perfected a technic which saves the motor root and the percentage of corneal ulcers is very small. It consists in a temporal approach under the temporal lobe. The posterior sensory root of the ganglion is identified and severed, leaving the motor root intact. This seems preferable to the Frazier method which saves the first division, as too frequently these patients later develop the condition in this branch, necessitating a second operation.

This operation is one of the most satisfactory in any field of surgery. The results are almost 100 per cent relief of pain. The mortality is very low and, although technically difficult, the operation may be readily performed by the surgeon experienced in this type of work.

Occasionally one meets a case of trifacial neuralgia that does not respond to operation. Fortunately these cases are very rare but those that do occur present one of our most perplexing problems. No form of treatment has given relief. I feel that we are now on the track of a solution of this problem and, to illustrate, will present the following case report.

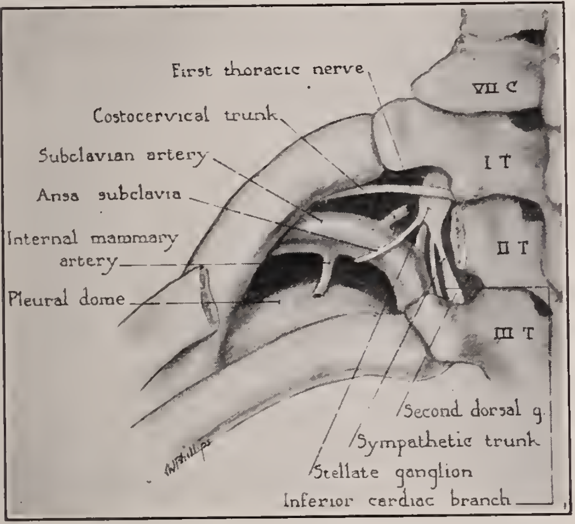

Fig. 2. Shows anatomic relations of the stellate ganglion on the left side.

The patient was an Italian laborer, thirty-seven years of age, suffering from what was diagnosed as trifacial neuralgia. On August 28, 1926, the Frazier type of operation was performed, preserving the ophthalmic division. Relief following this operation lasted only a few months when pain recurred in the opthalmic division.

On March 21, 1927, the sensory root was severed by a competent neurosurgeon. Following this operation there was relief only for a few months, when pain again recurred in the same area, in spite of the fact that the area of anesthesia proved conclusively that the root had been completely severed. From that time on he was treated by various physicians but the paroxysms of pain became worse and more frequent and finally, after various unsuccessful alcoholic injections, some one ventured to sever the ophthalmic division of the nerve at the margin of the orbit with, of course, no result. This was done about two weeks before I first saw him.

Shortly before I saw him the pain became so severe that it was necessary to hospitalize him, and even large doses of morphine gave no relief. During the paroxysms the man was frantic with pain. The eye seemed to protrude and the pupil at times would be dilated and at other times contracted. Trethylene was prescribed but gave no relief. I then decided to do an intracranial section of the nerve, following Dandy's technic, but upon further thought and observation I came to feel that this pain was sympathetic in nature and I decided to first do a dorsal sympathetic ganglionectomy. The pain by this time was so severe that the man tried three times to commit suicide, while in the hospital awaiting operation.

On June 25, 1929, a left dorsal sympathetic ganglionectomy was performed, removing the stellate and the second dorsal ganglion together with the intervening trunk and severing the rami communicantes, using the Adson posterior approach with removal of the second rib and transverse process (fig. 2). The patient made an uneventful recovery and was discharged from the hospital on the eighth postoperative day, perfectly well and entirely relieved of his pain. Of course, he developed a complete Horner's syndrome on the left side with a rather marked contraction of the pupil and enopthalmos. With the exception of an annoying pain in the left arm, which disappeared three months after the operation, he has had no trouble whatsoever.

It is still a little early to be too optimistic about this case and, until we have a few more cases with similar results, one cannot be certain, but I believe the immediate relief of pain lasting over three months to date certainly warrants the repetition of this procedure on similar cases. I feel that it explains the cause of our occasional failure to cure trifacial neuralgia by the accepted type of operation.

I offer this case, together with another which I will describe later, to add substance to my belief that sympathetics do carry pain sensation. The exact pathways of the sympathetics in the head are not accurately known but we know there are numerous interlacing paths, involving the various sympathetic and parasympathetic ganglia and the cranial nerves. A recent article by Peet[4] in the *Archives of Neurology and Psychiatry* offers a likely explanation.

Recently a new drug has been introduced for the relief of this condition. It is trichlorethylene, the trade name for which is trethylene. During the war the workers in certain munitions plants were found to be developing anesthesia of the face. It was traced to this drug which seems to have a specific affinity for the trifacial nerve, affecting none of the other cranial nerves. It is a highly volatile liquid with an odor similar to chloroform. It is inhaled in 20 or 25 minim doses on a piece of gauze, being careful not to let it come in contact with the mucous membrane. This should be used three times daily over a considerable period of time. It is said to be specific to such an extent that it may be used to differentiate trifacial pain from other painful conditions of the face, such as glossopharyngeal neuralgia, sphenopalatine neuralgia, etc. Personally, I have used it in several cases with only mediocre results but I feel that it should be given a thorough trial in every case.

In connection with alcoholic injection for trifacial neuralgia, I wish to mention the subject of painful conditions of the face, throat and neck, due to malignancies.

I recently had referred to me a man with an inoperable carcinoma of the jaw with such severe pain that he was unable to talk, eat or sleep. Fay[5] has recommended section of the sensory root of the gasserian ganglion, posterior rhizotomy of the cervical nerves and section of the vagus for these conditions. It occurred to me that the same palliation could be accomplished by alcoholic injections, avoiding multiple operative procedures in individuals having only a few months to live. It is frequently difficult to determine whether the pain that is present in these cases is due to involvement of the third division of the trifacial nerve or to pressure on the deep cervical nerves.

It was my intention to do alcoholic injection of the cervical nerves, if injection of the third division did not relieve this pain. However, I injected this division with immediate relief and the man was quite comfortable for the remainder of his life which was about five months. I feel that in a similar case I would not hesitate to inject the cervicals, if the injection of the third division was not effective and, if necessary, I see no reason why the glossopharyngeal nerve cannot be injected. I have done it with novocain for anesthesia.

### GLOSSOPHARYNGEAL NEURALGIA

This is a rather remote condition, appearing only recently in the literature.[7] The treatment is intracranial section of the glossopharyngeal nerve. There is still some doubt as to this being an entity, Fay believing that the pain is really of vagal origin. In contradistinction to trifacial neuralgia, the pain is deeper in the face and is most marked in the pharynx. Trethylene does not affect this pain and is supposed to be of value in the differential diagnosis.

We now come to the conditions of the spinal cord and the peripheral nerves.

### BRACHIAL PLEXUS INJURIES

The subject of injuries of the brachial plexus offers us one of the most perplexing of our problems. There are many types of brachial plexus injuries, ranging from birth injuries to gunshot wounds, stab wounds, fractures of the clavicle with brachial involvement, and to brachial trauma following a fall on the neck and shoulders. Every brachial plexus injury occurring at childbirth should be explored, if improvement is not noted in the first month. Frequently the trouble is due to hemorrhage and scar formation or to severing of the nerves of the plexus and early operation affords very good results.

The condition which interests and perplexes us most is the so-called traumatic brachial plexus neuritis. This condition is largely the result of two types of trauma: (1) actual trauma to the plexus itself outside of the cord, and (2) avulsion of the roots of the cord, due to an injury causing acute and forceful separation of the neck and shoulders.

The most frequent result is a traumatic neuritis which amounts to a traumatic neurosis. Injuries to the brachial plexus outside of the cord are amenable to direct surgical repair which should give good results, but too frequently the patients develop an ascending neurosis or neuritis, call it what you will, which responds to no treatment.

I will mention a certain case as a blanket example of what happens in so many of these cases.

The man was a motorcycle policeman. Six years ago he was thrown to the pavement, striking on his left shoulder and forcibly separating his neck and his shoulder. There was immediate paralysis of the arm resulting and shortly afterward the sensation of a third arm in which he had terrific pain. Soon afterward his brachial plexus was explored but his pain and paralysis continued. He finally came into our hands and, as is so frequently the case, pity caused us to undertake some method which might offer him relief, knowing full well that experience has taught us not to expect much in these cases.

Laminectomy was done and the roots which go to make up the brachial plexus were explored. The condition found was this: All the posterior roots from the fourth cervical inclusive, to the first dorsal were absent, with the exception of the sixth cervical which was curled up within the dura as though having been severed outside, and the first dorsal which was very small, as though a portion of it had been

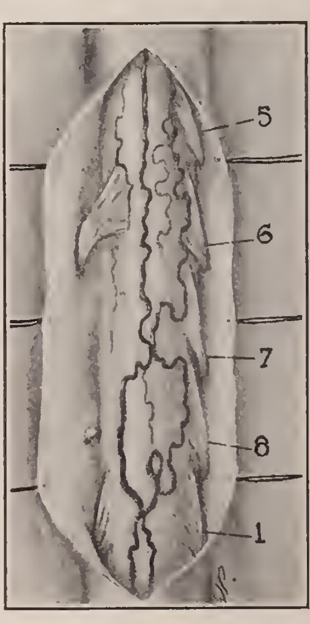

Fig. 3. Avulsion of the left fifth, seventh and eighth sensory nerves and all the motor roots except the eighth cervical.

avulsed. All of the motor or anterior roots were absent except the eighth cervical. The fifth cervical and first thoracic posterior roots were severed and also the eighth cervical anterior root to insure that any antidromic pain fibers, which might be present in the anterior root, would be severed (fig. 3).

Following this operation was the old story of no relief; in fact the condition was worse, according to the patient. Having long been interested in the sympathetics in relation to pain, I determined to sever his sympathetics in an effort to cure the pain. The anatomic justification for this was as follows:

The cervical roots have no white sympathetic rami, merely gray ones; the gray fibers are postganglionic. The first preganglionic fibers come off of the stellate ganglion which is a fusion of the eighth cervical and first thoracic sympathetic ganglia. The sympathetic supply to the arm comes through the stellate and the first and second thoracic ganglia. Any ascending stimulus traveling in the sympathetic trunk must of necessity enter the cord through the stellate and second dorsal ganglia by way of the white rami, since there are no white rami higher up. If the sympathetics do carry painful stimuli these must enter the cord by this pathway and severing these connections should stop the pain.

This was carefully explained to the patient and the experimental nature was stressed and nothing promised. He consented to the operation and four months ago a dorsal sympathetic ganglionectomy was done by the posterior approach, removing the stellate and the second dorsal ganglia and the intervening trunk, and all rami were severed. With the exception of a mild postoperative pneumonia, probably due to trauma of lung or pleura during the operation, his recovery was uneventful.

It is now four months since the operation. The pain has been entirely relieved and the sensation of the third arm is rarely present. At certain times, under nervous stress or when indulging in alcohol, the third arm sensation is noticeable but most of the time he is not conscious of it. He is back to work and is again a useful citizen for the first time in six years. This case also would indicate that sympathetics carry painful stimuli. I am inclined to believe that painful amputation stumps and similar conditions may be attacked along similar lines, where other methods fail.

## CERVICAL RIB

Adson[8] has developed a very simple method in the treatment of cervical rib causing symptoms. These patients frequently have severe pain, due to pressure on the brachial plexus. The usual operation for the removal of a cervical rib is mutilating, difficult and dangerous. Adson's technic consists in a tenotomy of the scalenus anticus and a decompression of the brachial plexus forward. The results are striking and the operation is easy and carries a minimum of risk.

## PAIN OF CORD ORIGIN

Among the causes of pain of cord origin are: (1) cord tumor, (2) cord compression due to trauma, and (3) angioma or varicosities of the cord. The relief of pain of cord tumor lies in removing the tumor. The relief of pain due to cord trauma, of course, consists in laminectomy. The third condition, angioma or varicosities of the cord, is of great interest. This condition frequently simulates cord tumor. There is root pain, frequently a sensory level; there may even be a block, and the condition may even go on to cause paralysis.

The diagnosis is usually cord tumor, although as we study our cases we are impressed by two major findings: first, the prominent role of pain and the wavy character of the pain; and, second, the frequency of marked tenderness on pressure over the spines of the vertebrae.

Some time ago I operated on a woman who had a definite sensory level. She had become bedridden due to pain and weakness of one limb. Her level was the nineth dorsal segment but she had exquisite tenderness of all spines from the seventh dorsal down into the lumbar region. Exploration revealed no tumor, merely moderate varicosities of the cord. Decompression, removing five spines and laminae, gave immediate relief, and this woman is now free from pain and doing her work. This condition is usually found in women who have had several children. Whether this is significant is a matter of conjecture. It also occurs following trauma (fig. 4).

Possibly many of our cases of trauma to the vertebrae, who either have no neurologic findings or recover from them, yet continue to be incapacitated due to pain, may be explained on this basis. In some cases there are merely varicosities; in others it may amount to an angiomatous tumor. In either case it is very unwise to attempt removal or ligation, as one merely gets into a great deal of trouble (fig. 5).

## POSTERIOR RHIZOTOMY

Posterior rhizotomy consists in the intradural avulsion of the posterior sensory roots. Frazier[9] has probably done more of this type of work than any other man. The anatomic and physiologic basis for this operation is evident. It consists in an interruption of the sensory pathways from a painful area to the cortex at their entrance to the spinal cord. It is applicable to many types of pain. I have already mentioned my case done for brachial plexus trauma. It is very effective in pain due to carcinomatous involvement of the brachial plexus.

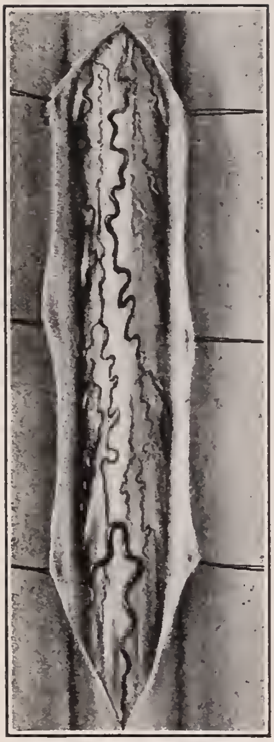

Fig. 4. Varicosities starting at the seventh dorsal segment and extending to the conus. Also shows varicosities of the veins following the sensory roots on each side, particularly on the right.

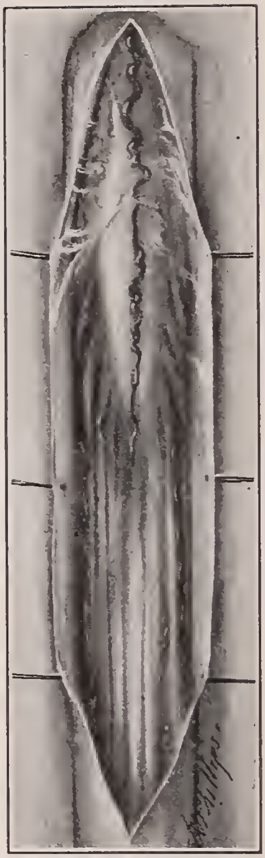

Fig. 5. Exposure of the conus and cauda showing extensive adhesion of the arachnoid to the conus and roots. There is also marked varicosity of the central vessel with varicose veins extending along the roots, more marked on the right side.

In these cases the fifth cervical to the second thoracic roots inclusive are divided. I have already mentioned the possibility of its use in amputation pains. Frazier reports one case with marked improvement.

In long standing, severe cases of postherpetic neuralgia, rhizotomy of the roots involved is indicated. Frazier reports a case with excellent results. In gastric crisis some very favorable results are reported. The seventh to the tenth thoracic roots inclusive are divided bilaterally. Frazier has collected a total of 73 cases from the literature. Fourteen of these were cured and 31 improved, 6 temporarily improved, 5 unimproved and 16 died, giving a mortality of 13.7 per cent. This is rather high. Frazier reports no operative mortality in his cases.

Guleke[10] has advocated unilateral laminectomy and extradural rhizotomy, the advantage being that the dura does not have to be opened, thus avoiding the possibility of infection and also the loss of spinal fluid. These advantages, however, do not warrant the choice of this operation. With present day technic the chance of infection is very slight. The loss of spinal fluid is of little consequence and is easily overcome by so placing the patient on the table that the opening in the dura will be at the highest level and tucking cotton between the dura and the cord above and below.

The unilateral laminectomy is a rather difficult one in which to get sufficient exposure and it is much more difficult to identify the proper roots to be divided. Rhizotomy is a much more satisfactory procedure, when performed with a complete laminectomy. The important considerations are the proper position of the patient, the absolute identification of the roots to be severed and hemostasis. It is very important to keep blood from coming in contact with the cord or entering the subarachnoid space. It is very necessary to make all manipulations with the utmost gentleness, as the cord does not tolerate well even the slightest trauma. It is necessary to expedite the entire procedure as there is considerable shock connected with long continued operations on the cord. It is unnecessary to ligate the roots on both sides of the point at which they are to be divided: merely the distal end need be ligated. The division of the roots should be made as far from the cord as possible to avoid traction on it (fig. 6).

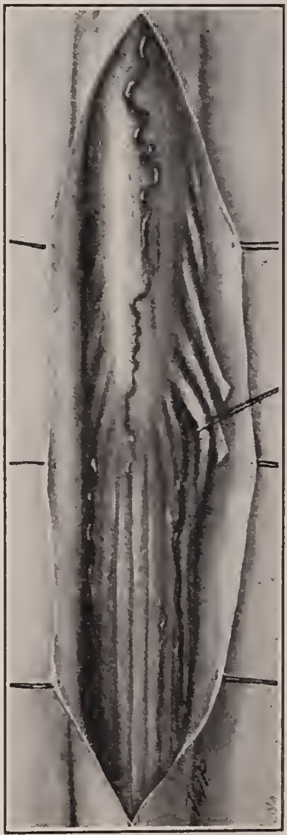

Fig. 6. Shows adhesions of the dura and arachnoid separated, and two posterior roots severed and one about to be severed.

The operation of rhizotomy is rapidly gaining favor and its application will, no doubt, be considerably extended. I have only mentioned a few of the conditions in which it is applicable.

### CORDOTOMY

The operation was first suggested by Spiller[11] in 1912. The spinothalmic tract which carries the pain and temperature sensation of the contralateral side of the body is accurately

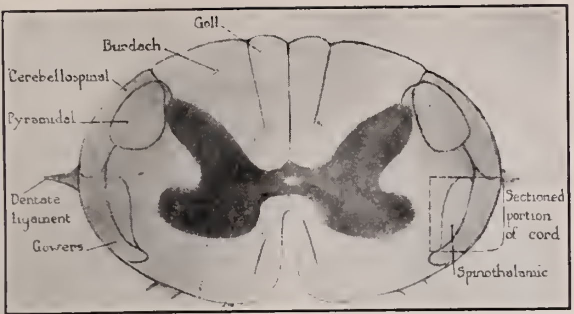

Fig. 7. Cordotomy. Diagrammatic section of the cord, showing area included in the incision.

localized in the anterolateral columns of the cord. It extends to a depth of 2.5 mm. from the surface just anterior to the dentate ligament (fig. 7). Spiller suggested that this tract be severed in cases of intractable pain due to pelvic malignancies. Since then the operation has been done by a number of men with very good results. The section is best performed at the level of the fifth or sixth dorsal segment. Laminectomy of two spines and laminae is done and the dura opened. In order to approach the area to be sectioned, it is necessary to rotate the cord somewhat; this is done by gentle traction on the dentate ligament. The section is accomplished by use of a special cordotomy hook and knife, so constructed as to penetrate the cord just 2.5 mm. in depth.

It is of paramount importance that the section be exactly applied. If too deep a section is made, the pyramidal tracts also will be severed with resulting paralysis of the limb. If too superficial a section is made, the spinothalmic tract will not be severed and the result will be failure.

The operation is most used, as I said before, for malignant conditions causing severe pain. These individuals, knowing that their time is limited, are very grateful for the relief of pain afforded them for the balance of their lives. Any procedure which will give them relief is certainly indicated, even though the life expectancy is very short. This operation may be applied as high as the seventh cervical segment, so that we have here an agent for the relief of intractable pain in the major portion of the trunk and lower limbs.

It has other applications besides those mentioned. For example, in cases where rhizotomy fails to relieve pain, it can be used for all the conditions for which rhizotomy is advocated, such as tabetic crisis and postherpetic neuralgia. We have all seen cases of sciatica go on to complete disability. In this type of case cordotomy would be worth while.

## SCIATICA

This brings up a very simple procedure which has given almost miraculous results in many cases and excellent results in approximately 50 per cent of cases. The use of epidural injection for sciatica is not new but it is very much neglected. It should be used in conjunction with other methods of treatment and after the eradication of all foci of infection. There are two types of sciatica, neuritis and neuralgia. It is rather difficult to differentiate these at times. The true sciatic neuritis is usually a constant pain with tenderness over the nerve, whereas in neuralgia the pain is not so constant and the tenderness slight or absent.

At first it was thought that only the neuralgic type could be benefitted but this has not been found to be the case. It has been found that the best results are obtained when the injection is done early, that is, within the first year, but every case should have the benefit of a trial at least. I have seen many cases entirely cured of their pain immediately following injection; others improved and were cured by a second and third injection.

Some months ago I injected a woman who had been suffering for three years, constantly getting worse in spite of all treatment. While the first syringeful was being injected she complained bitterly of pain in her affected limb. This is almost a certain sign that the injection will give relief, so I proceeded to fill up her canal. It was a painful procedure but gave immediate relief and she has constantly improved and is now entirely relieved. The injection will be repeated if pain recurs.

The injection is done by accurately inserting a needle in the caudal canal and injecting from 40 to 60 c.c. of 1 per cent novocain. Saline would probably give the same results, novocain being used because of its immediate anesthetic effect. If in the course of the injection there is reduplication of the patient's pain, one is almost certain of a good result. In the course of doing caudal anesthesia for rectal operations two patients complained bitterly of pain in one or the other limb. On questioning them I found that both were sufferers from sciatica so I filled their canals incident to the injection; both of these patients are no longer bothered with sciatica pain.

The theory of this procedure is that in many cases the pain is due to filmy adhesions of the sensory roots and ganglia in the caudal canal. When the canal is well filled with fluid, these adhesions are broken down and consequently the pain is relieved. The injection is so simple and so innocuous that every case should have the benefit of a trial. The only essential is that the needle must be accurately placed and this is not always easy.

### SYMPATHECTOMY IN ARTHRITIS

I have already mentioned the relief of pain by means of dorsal sympathectomy. There are many painful conditions which may be entirely relieved by sympathectomy properly applied. Space prevents the discussion of all of these various conditions at this time. I do wish to mention, however, the results of sympathectomy in chronic polyarthritis.

Adson has reported six cases with startling improvement. I have done to date four bilateral lumbar sympathectomies in cases of polyarthritis. The last was done within the week so that it is too early to report on it.

The first case was a man 36 years of age, who had been bed ridden for over a year, complaining of severe pain in both limbs, worse in the left. He was unable to move either his ankles or his knees and the right hip was fixed. There was the typical deformity that one sees in arthritis deformans with cold extremities requiring constant artificial heat.

Operation was performed eight weeks ago. Much to my surprise he was immediately relieved of his pain. There was a temperature increase of 18° degrees in the left leg and 10° in the right and in less than three weeks he was able to move his ankles. At the present time he has normal range of motion in the ankles, his knees are improving and the right hip seems to be almost normal. There has been no pain whatsoever since the operation.

The second case was a woman having had arthritis for fourteen years. For the past year she has been unable to walk, being confined to a wheel chair. There was quite severe pain in both knees and marked limitation of motion. An operation was performed four weeks ago. There has been absolutely no arthritic pain since that time and the joints are rapidly improving so that she is now able to walk with the aid of crutches.

The third case was done two weeks ago. This was a young woman, 30 years of age, having had typical arthritis deformans for eight years with severe pain in all of her extremities, more marked in the lower extremities. Since the operation she has had but one complaint, that her feet are too warm; previous to this her feet were always too cold. Her arthritic pain has entirely disappeared.

We may see, then, from a review of these cases and those of Adson, that in certain types of chronic arthritis we may promise an immediate relief of the arthritic pain by the use of sypmathetic ganglionectomy.

### SUMMARY

The anatomy and physiology of pain are briefly reviewed.

Trifacial neuralgia is described and the use of peripheral avulsion, alcoholic injection and resection of the sensor root of the gasserian ganglion discussed. A case is reported in which dorsal sympathetic ganglionectomy relieved a painful condition of the face which did not respond to section of the sensory root. Alcoholic injections in painful conditions due to malignancies offer nonradical measures of relief.

Dorsal sympathectomy relieved the pain in a case of traumatic brachial plexus neuritis after rhizotomy had failed.

The operative indications for posterior rhizotomy and cordotomy are reviewed.

Injection of 40 to 60 c.c. of 1 per cent novocain epidurally gives startling relief in certain cases of sciatica.

Four cases of polyarthritis are reported, upon whom bilateral lumbar sympathetic ganglionectomy was performed with immediate relief of the arthritic pain and marked progressive improvement in the joint symptoms.

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# MOTILITY OF THE DUODENUM*

H. J. Whitacre, M.D.
TACOMA, WASH.

Digestive symptoms are so often the chief complaint of patients who consult us and a disordered digestion is so uniformly associated with a majority of the diseases that we treat, that I have considered it worthwhile to devote my allotment of time on this program to an analysis of certain experimental laboratory results which have a bearing on duodenal function and attempt to give them an application to clinical surgery. We have lamented for a long time the lack of an accurate knowledge about the physiology of digestion but the experimental laboratories are now giving us a vast amount of material for study, and it is our duty as clinicians to evaluate these results and carry as much of them as are applicable to the bedside.

Certain concepts regarding the gastrointestinal tract as a whole need to be presented before the duodenum is discussed as a unit. The gastrointestinal tract has three fundamental physiologic phenomena, motility, secretion and absorption; and of these motility is by far the most important function for us to study because probably 80 per cent of the symptoms of so-called stomach trouble are due to interference with the motor function. Two other facts to be borne in mind are that 90 per cent of digestive symptoms do not have origin in the stomach, and chronic gastritis is a rare disease. ??

The monumental work of Alvarez[1] has given us altogether the best conception of the motor function of the tract that we have had and I feel we must have his conclusions in mind while we are discussing the duodenum. He has shown, first of all, that peristalsis and motion in the gastrointestinal tract are myogenic in origin and not related to the extrinsic nerves (vagus and sympathetic) except as they may have a regulatory influence, conduct reflexes and harmonize larger movements. He has shown, further, that the rate of rhythmic muscular contraction is highest in the stomach and progressively slower downward to the anus.

He concludes also that there are additional and related gradients of metabolism, rate of rhythmic contraction, irritability and tone which are correspondingly high above and low below. By a very accurate adaptation of these gradients to the different levels food is progressively worked over by rhythmic segmentation and reversed movements and carried onward by peristalsis and peristaltic rushes. Normally all gradients are highest in the stomach, lower in the duodenum and lowest of all in the rectum. The stomach is the pace maker.

Irritation at any level in the scale will steepen the gradient at this point, whereupon waves of peristalsis will be started in both directions, holding back material coming down from above and hurrying onward material that is already below. This explanation of gastrointestinal motility is directly applicable in the explanation of a great variety of abdominal symptoms and has done much to focus our attention upon the intestinal tube itself.

The duodenum has the same three fundamental physiologic phenomena that have been attributed to the gastrointestinal tract as a whole, motility, secretion and absorption, but the latter two functions are relatively unimportant. All physiologists are agreed that normal motility in the duodenum is characterized by rhythmic segmentation, peristalsis, peristaltic rushes and reversed movements.

Wheelon has shown how rhythmic segmentation causes a "to and fro" movement of the contents to mix them thoroughly and concludes that it is the local contact of the contents with the mucosa, most marked in the distal portion of the duodenum, that causes the rhythmic segmentation.

Peristaltic waves are started chiefly by the ejection of the stomach contents into the duodenum and they travel to the end of the segment. Bile ejection may also cause peristalsis. It is still a mooted question as to whether or not gastric waves travel on into the duodenum. Alvarez believes that all gastric waves stop at the pylorus. Luckhardt, Phillips and Carlson,[2] and Wheelon and Thomas[3] believe that some waves pass over. Ivy[4] thinks that some waves pass over after a brief pause at the pylorus and is quite sure that every gastric wave does not open the sphincter. He has demonstrated a very close relationship between the motility waves of the two in hunger. He has made an interesting observation in the study of duodenal peristalsis to the effect that there is a normal irregularity of the wave which leads to retention in the cap and at the inferior flexure which is much accentuated in chronic duodenal obstruction. This observation may have a clinical value in the interpretation of roentgen studies.

Another experimental result of great clinical importance in the study of peristalsis has been contributed by Dragstedt and Dragstedt.[5] These eminent physiologists have shown that a pressure of only six inches of water, when applied by a light condom bag around the lower end of the duodenum, was sufficient to cause complete obstruction and rapid death. A lesser pressure than this caused hyperperistalsis, dilatation, some hypertrophy, intermittent nausea and vomiting, and mild toxemia. Ivy has demonstrated that the duodenum is more susceptible to external pressure than any other part of the gastrointestinal tract.

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I do not see how we can escape the clinical application of these valuable results. They give a full explanation of acute gastromesenteric ileus and point the way to treatment. They show, furthermore, how the mesenteric pull of right coloptosis, bands, congenital defects and adhesions at the fossa of Treitz can produce enough of obstruction to cause a chronic duodenal obstruction and all of the symptoms that are mentioned by Dragstedt.

Five years ago I reported to this society my own clinical experience in chronic duodenal obstruction and since that time have had a great many experiences which strengthen my belief that chronic duodenal obstruction is a real condition and that the results of treatment are as striking as one sees anywhere in surgery. Unless one knows about this extreme susceptibility of the duodenum to external pressure, he may not even think about the possibility when he is studying the case nor will he estimate properly the importance of deforming pathology when he is working inside the abdomen.

All physiologists now agree that reversed peristalsis for the purpose of regurgitating the slightly alkaline contents of the duodenum into the stomach is a normal function of the duodenum, and the experimental work of Mann[6] may indicate that a disturbance of this function is the chief cause of duodenal ulcer. An excessive reversed peristalsis is pathologic and produces symptoms. Keeton[7] and many other authorities have demonstrated a reversed peristalsis in a variety of conditions. Henderson[8] reports this condition in 93 per cent of patients infected with hookworm disease, where there is almost certain knowledge that a duodenitis exists. Friedman, Strauss and Arens[9] have found it in a long series of cases of cholecystitis and believe it is due to a concomitant duodenitis. Thoring and Smith[10] have seen it in cases of adhesions only. Ivy[11] says that it is probable that reversed peristalsis will be caused by anything that increases irritability of the mucosa or the musculature of the duodenum and that by nature and design the duodenum apparently attempts to protect itself by regurgitating its contents into the stomach.

Why should we be concerned about reversed peristalsis? The answer must be, because an excessive reversed peristalsis is pathologic and causes most of the symptoms that have been attributed formerly to the stomach.

Nausea and vomiting are probably largely duodenal symptoms. Luckhardt, Phillips and Carlson, Ivy, Wheelon and Keeton agree that vomiting is more readily elicited by duodenal irritation than by gastric. Ivy says that the vomiting impulse caused by pharyngeal or gastric irritation can be inhibited voluntarily, but not the duodenal because it is so much more rapid and violent in its onset. Alvarez does not locate the vomiting impulse specifically in the duodenum but agrees in fact with the preceding conclusions, when he states that it is not produced by lesions of the stomach but is due to reversed peristalsis. It is probable that irritation at any point in the lower bowel can produce reversed peristalsis in the duodenum by sending waves upward. A chronic appendicitis will give a typical duodenal syndrome. Ivy has seen regurgitation of bile into the stomach following a water enema and Alvarez says that much of our postoperative vomiting is caused by enemas and even by the Murphy drip.

Biliousness has nothing to do with the liver. Bile is normally present in the stomach and the symptoms of vomiting, prostration and headache are duodenal and evidence of duodenal dysfunction. Eructations, the tasting of food for hours after ingestion, a coated tongue and foul breath have nothing to do with the stomach. They are symptoms of reversed peristalsis in the duodenum.

Heartburn or sour stomach is not due to an excess of acid in the stomach but to reversed peristalsis, probably in the fundus of the stomach, which brings the normal acid contents into the esophagus. All authorities are agreed upon this point. Bloomfield and Keefer[12] not only agree with this conclusion but say that the volume of the secretion and the acidity of the juice is constant for the same person. In a study of abnormal cases they found characteristic changes in only two types of cases. Gastric ulcer uniformly gave high volumes and high acid values, while cancer gave low volumes and a failure to secrete acid. Motility varied greatly in health and disease.

Another symptom of reversed peristalsis is a feeling of fullness after beginning to eat and a feeling of gas after eating. Roentgen-ray and other studies have shown that the gas bubble in the stomach is fairly constant, that gas is not found in those who are sure that they have it, and that these symptoms are nature's way of telling us that the gradient has been reversed.

Pain in the right upper quadrant after eating is very often the result of spasm of the duodenal musculature or it may be the result of spasm of the pylorus which has been set up by duodenal irritation.

In this connection it should be stated that Brunemeier and Carlson,[13] Ivy, and Brickner and Mitch[14] have shown that stimulation of the duodenum inhibits the motility of the stomach and they have concluded that the duodenum possesses a mechanism for controlling the motor drive of the stomach. It would appear, therefore, that the duodenum is able not only to return objectionable contents to the stomach but it can hold it there. This will explain the huge quantities of fluid that can be repeatedly recovered from the stomach in obstruction and the presence of a six hour stomach residue in ulcer of the duodenum with no mechanical obstruction at the pylorus.

Inasmuch as the physiologists have given us this much information regarding the normal and the irritated duodenum, I feel that we should try to give it clinical application. I have already quoted Ivy as saying it is probable that a reversed peristalsis can be caused by anything that increases the irritability of the mucosa or the musculature of the duodenum. I have also quoted Dragstedt and Dragstedt and others as saying that the duodenum is extremely susceptible to external pressure. These are very significant statements, and, if true, indicate that we must study the duodenum very carefully and with special reference to both irritation and pressure, whenever we are operating in this region.

Cholecystitis, for instance, is a disease that manifests itself very largely by symptoms of a disturbed digestion, and almost all of the symptoms that characterize the disease have been demonstrated by physiologists to have their origin in the duodenum. I have studied the pathology of a long series of cases of cholecystitis with definite reference to the symptomatology and believe I am correct in the conclusion that cholecystitis produces digestive disturbances in direct proportion to the degree in which it causes a duodenitis, or adhesions that irritate, deform or press upon the duodenum. I believe, furthermore, that I have proved that an operation which deals with the gallbladder alone and leaves adhesions behind will fail to cure the digestive symptoms from which the patient had previously suffered. I have made the same observations regarding the cure of digestive symptoms in the operative treatment of duodenal ulcer. I feel quite sure that adhesions can disturb the mixing movements of rhythmic segmentation, stop peristaltic waves and cause reversed peristalsis.

There is one other motor element in the duodenum that should be mentioned. Burget,[15] Graham[16] and others have shown that the tonus and motility of the duodenum plays a fundamental role in the passage of bile from the gallbladder and bile passages, and Ivy says it is quite possible that hypertonus, amotility and reversed movements of the duodenum may be important factors in disease of the biliary pasages. The sphincter of Oddi would seem to be the element concerned. Mann[17] says that this sphincter is an anatomic and physiologic reality and that its function is not to prevent the gallbladder from emptying but to cause it to fill. He has also shown that it takes a minimum pressure of 5.0 cm. of water and a maximum pressure of 67.5 cm. to overcome this sphincter, while Ivy[18] has observed in his cholecystokinin experiments that a spastic duodenum can cause enough hypertonicity of the sphincter of Oddi to prevent the evacuation of bile.

I have now discussed the four important motor functions of the duodenum, namely, rhythmic segmentation, peristalsis, reversed peristalsis and the mechanism for controlling the motor drive of the stomach. I have shown that these normal functions are easily disturbed and have given the experimental evidence that it is a disturbance of these motor functions that produces most of the symptoms of so-called stomach trouble. The central idea of the entire presentation has been to locate this group of symptoms definitely in the duodenum, explain their origin and point to the clinical use that can be made of this information.

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# TREATMENT OF FRONTAL SINUS INFLAMMATIONS *

Louis H. Klemptner, M.D.
SEATTLE, WASH.

Practically all acute cases of frontal sinus inflammation are recovering under conservative treatment, even if the symptoms are very trying, as is true of most of the chronic cases. Only in the latter quite frequently succor must be obtained from endonasal operations, as removal of polyps, of the anterior end of the middle turbinate, submucous operation, probing and washing of the sinuses.

There is a great difference of opinion as to how frequently probing of the frontal sinus can be done successfully. Mosher, in a university extension course in this city, stated that it cannot be done. Barnhille and Phillipps in the latest edition of their book allow a limited number. Denker and Hayek give 50 per cent possibilities and more if endonasal operations are performed.

From my personal experience I can state that success grows with the experience. Flexible probes or cannulae should be used, any force being avoided as the lamina cribrosa is not far off. Middle turbinate and middle meatus are cocainized, cannulae introduced in the hiatus directed upwards, forwards, and in most cases slightly inwards. A flow of pus will frequently guide the probe.

I am showing you a few slides from patients with the cannulae in situ and the reports give the indications for their use.

1. This is the slide of Mrs. C. J., who was hit by a bullet in the forehead twenty years ago. Lately she complains of severe headache and her attending physician asked me to ascertain, if there was any pus in the left frontal sinus. The nasal cavities are free. Translumination shows clear sinuses. The roentgenogram shows small particles of lead in the region of the left frontal sinus and forehead. The frontal sinuses are small but clear. The end of the introduced cannula is in the entrance of the left frontal sinus (figs. 1 A and B). I probed and washed the sinus with saline; no pus was found.

2. Mrs. F. S. complained of headache and profuse discharge from right nasal side. No discharge visible in either nasal side. Translumination shows a darker right frontal sinus. Roentgenogram shows large frontal sinuses, right slightly blurred, antra small and dense. In both frontal sinuses are cannulae (fig. 2). No secretion was found in the frontal sinuses when washed out.

3. John L. had severe right sided frontal headache for a whole week which would not subside under ordinary treatment. Pain on pressure on the forehead. The septum is deflected to the right, pus in the right middle fossa. Right frontal sinus and antrum appear dark on translumination. Roentgenogram shows a blurred right nasal side and the cannula in the right frontal sinus (fig. 3). The first washing produced much pus and headache improved immediately. In another week the patient was well.

4. W. K. suffers a few days from severe headaches after a cold. The right upper lid is drooping and swollen, the eye is congested, there is lachrymation and photophobia. Vision of right eye 8/10, of left 6/6. The fundus is normal. Pressure on right forehead is painful.

Slight deviation of septum to right, very little pus in middle fossa. Translumination shows both frontal sinuses dark, also right antrum. Roentgenogram of both frontal sinuses is blurred, the right more so, the right antrum cloudy. Cannula introduced in right frontal sinus (fig. 4). The right antrum had been washed out but no pus was found. Copious pus was evacuated, when I washed the frontal sinus. In a few days the left frontal sinus was affected too. Both nasal sides were washed out several times. That was one year ago. The same patient had a similar attack not long ago which lasted a whole month.

Seldom the frontal sinus alone is affected, the anterior ethmoid cells being frequently diseased, or frontal and maxillary sinuses of the same side. Hence it is difficult to decide, if the antrum is not serving as a reservoir for the frontal sinus. Different other combinations are possible.

5. In the next case antrum and frontal sinus of the same side are involved. Richard L. had stomach trouble for a few months. Besides he had severe headaches and right sided purulent nasal discharge. He had deflected septum with pus in right choana.

Translumination showed right frontal and maxillary sinuses dark. Roentgenogram gave blurred right side with cannula high up in the right frontal sinus (fig. 5). Pus in antrum and frontal sinus. I removed the anterior end of middle turbinate before I was able to wash out the frontal sinus. The patient was from out of town, left in a few days improved. I have not heard from him since.

6. Another case of antrum and frontal sinus infection. Mrs. John S. had for five months a foul smelling discharge from left nasal side. One month ago a dentist removed two left upper molars and tried to wash the antrum through an alveolar opening.

A fistula through the alveolus of the second upper molar leads in the antrum. The septum is deviated to the left. The left middle turbinate is considerably swollen and releases large amounts of foul smelling pus when lifted up. Roentgenogram shows clouded left sinuses and the cannula in situ (fig. 6). I removed anterior end of middle turbinate and washed antrum and frontal sinuses. Patient recuperated.

But matters do not always go smoothly.

7. Mr. L. M. complained of headache and blurred vision of right eye for last three months. Is unable to concentrate in his work. Pressure on right forehead is painful. Edematous right middle turbinate, pus in middle fossa, rough bone in region of anterior ethmoid cells, pus in frontal sinus and foul smelling pus in antrum.

Translumination shows dark right side. Roentgenogram shows the whole right side blurred, the cloudy right frontal sinus very large, extending to left with the cannula in it (fig. 7). Wassermann negative. I performed Denker operation of right antrum with removal of anterior end of middle turbinate and ethmoid cells, washing of frontal sinus. Treatment lasted six months. Headaches disappeared, eyes improved, but there is still some discharge from the nose.

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* Read before the Puget Sound Academy of Ophthalmology and Otolaryngology, Seattle, Wash., June 17, 1929.

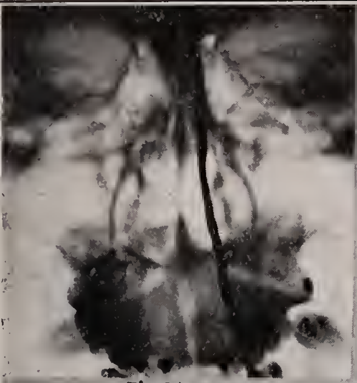

Fig. 1A

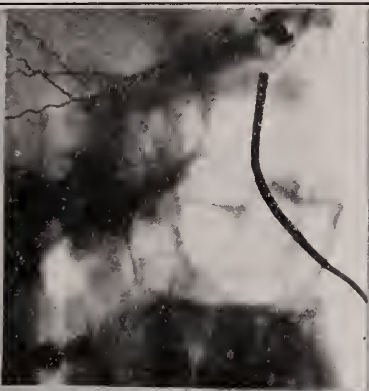

Fig. 1. B

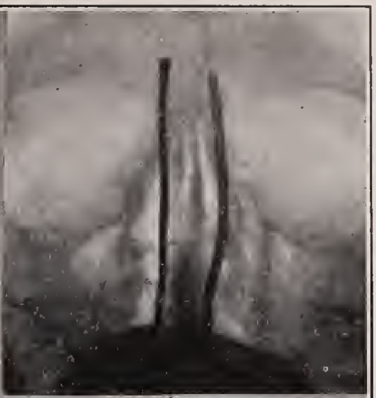

Fig. 2

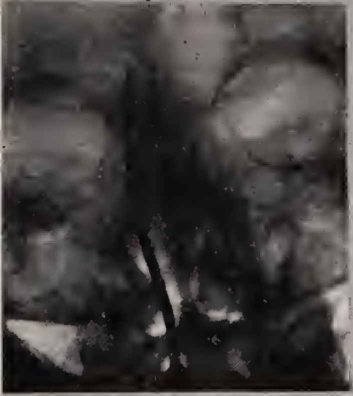

Fig. 3

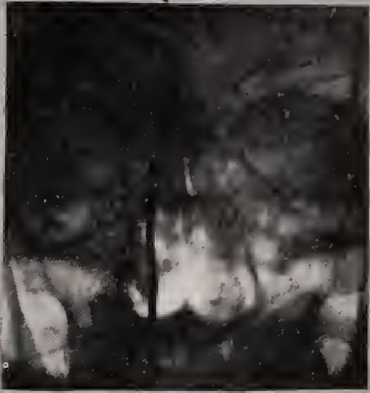

Fig. 4

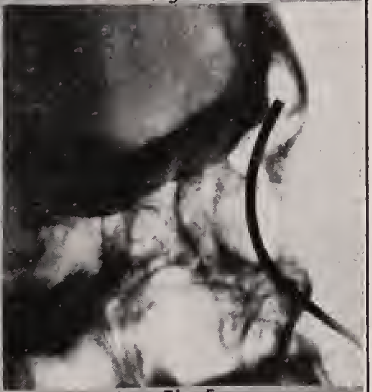

Fig. 5

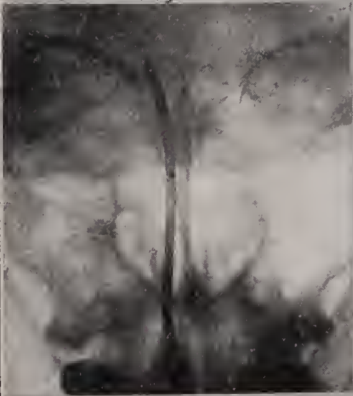

Fig. 6

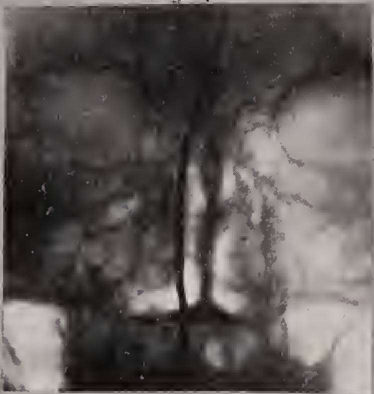

Fig. 7

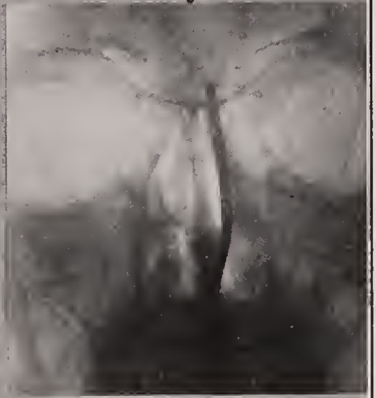

Fig. 8

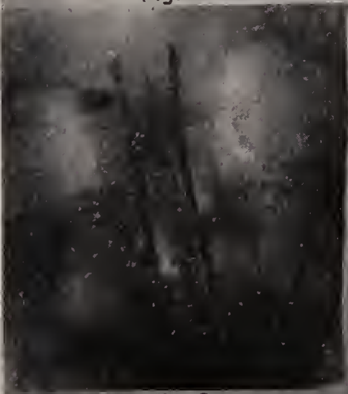

Fig. 9

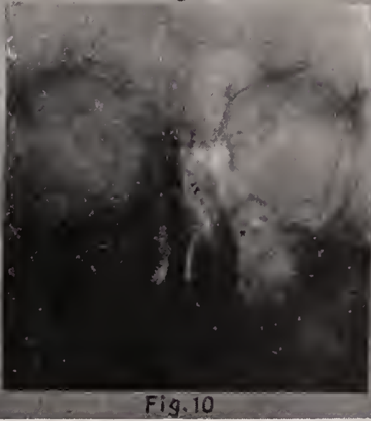

Fig. 10

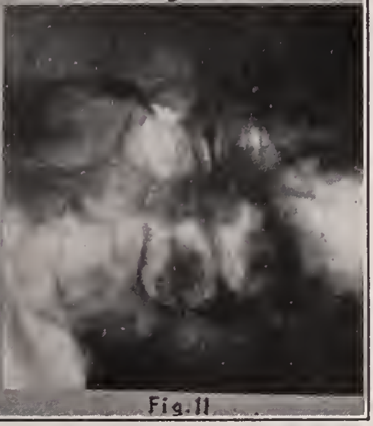

Fig. 11

I will now present a few cases with double sided affections.

8. Mrs. O. D. suffered for many months from headaches, stomach trouble and profuse discharge from both nasal sides. Patient is considerably underweight, very anemic. Pus in both nasal sides.

Translumination shows right side dark, left less so. Roentgenogram shows all sinuses blurred on both sides but especially antra; cannula in right frontal sinus (fig. 8). Wassermann negative. Denker operation on right side. Polyps were found in the antrum. Removal of right ethmoid cells, anterior wall of right sphenoidal sinus, which is filled with polyps and washing out of both frontal sinuses. Treatment lasted for eight months, but patient got perfectly well with no discharge and general health good.

9. Here is another case of double sided affection. Mrs. O. P. has had since childhood profuse purulent discharge from both nasal sides, obstructed nasal breathing, headaches. Foul smelling pus in both nasal sides, deflected septum to right, enlarged polypoid degenerated middle turbinates, foul smelling pus in both antra.

Translumination shows both sides dark. Roentgenogram shows sinuses blurred on both sides and cannulae introduced in both frontal sinuses (fig. 9). Double sided Denker operation. Polyps were found in both antra. Washing out of frontal sinuses. Treatment lasted for two months. Headaches disappeared, some discharge left.

A quite interesting case is the following. How conservative treatment combined with endonasal surgery are sometimes sufficient to bring to a standstill and cure a threatening rupture of an ethmoid empyema is demonstrated in a case of sinistral pansinusitis of a twelve year old girl. This patient was treated three years previously for a sinistral highmoritis.

On February 21, 1927, patient had a cold with high temperature, severe left sided headache and left nasal discharge. Four days later the left eye started to protrude and turned outward, the upper lid got swollen and she was seeing double. The left nasal side was overflowing with pus. The middle turbinate was swollen and released a profuse discharge of pus when lifted. The vision of right eye was 6/6, of left 8/10. The fundus normal. Crossed double vision. Roentgenogram showed blurred left side (fig. 10).

I removed the anterior end of middle turbinate, ethmoid cells and washed the frontal sinus. In a few days the secretion got less, the eyeball started to recede, the swelling to subside and in two months the patient was well. Ruptures mostly occur in chronic cases with acute exacerbations, as was the case here.

In the beginning of the paper I stated that practically all acute cases of frontal sinus infection are getting well under conservative treatment and I have the authority of Denker, who claims that in twenty years of practice he had no external operation done in an acute case. But here is the slide of an eighteen year old boy with acute frontal sinusal empyema, where I operated externally.

11. This boy was suffering for three weeks from a severe left sided headache. The left upper lid is so swollen, that it is hard, immovable and totally covers the eye. The left forehead and left side of the face are swollen. Temperature is 101°. All visible parts in the left side of nose are congested. Very little discharge. Breathing through left side blocked.

Translumination and roentgenogram show blurred left frontal sinus (fig. 11). I evacuated a considerable amount of pus through an external opening on the inner third of anterior wall of left frontal sinus, after which the patient got well.

### CONCLUSIONS

1. Practically all acute cases of frontal sinus inflammation and most of the chronic cases are getting well under conservative treatment.

2. Roentgenography is most important to ascertain the size of sinuses but not convincing for diagnosis.

3. Blowing out and washing out of the frontal sinuses are of great help for diagnosis and treatment but should not be practiced indiscriminately.

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## A DRESSING FOR FRACTURE OF FEMUR IN AN INFANT

D. Homer Junkin, M.D.
IDAHO FALLS, IDA.

While delivering a difficult breech presentation the right femur of the infant was fractured near the junction of the upper and middle thirds. A number of dressings were applied but the position in each instance was unsatisfactory. The dressing described below proved very satisfactory in this case.

Figure 1 illustrates location of fracture. A plaster cast is placed about pelvis and on thigh to point of fracture (fig. 2). The cast should not extend below the lower end of the upper fragment. Moleskin adhesive tape is applied from a point just below the site of fracture to the ankle and firmly secured by overlapping strips and gauze bandage.

A tubular pasteboard (fig. 3, a) is placed against the pelvic cast. The circular carton in which the hospital roll of adhesive is received was used by the author. It was cut off at a point corresponding to the infant's ankle. Over the tubular pasteboard plaster is applied and extended in a U shape at the end of the tube to provide support for traction (fig. 3, b). A rubber band is attached to the wooden block at the end of the moleskin strips and a wooden tongue blade used to twist the rubber until sufficient traction is obtained to reduce deformity. A small scale (fig. 3, c) was placed, as shown in drawing, and a two and one half pound pull, as observed with the fluoroscope, was found sufficient to reduce the deformity. Fig. 4 shows actual photograph of this case.

### SUMMARY

The child was comfortable and could be carried with ease.

Fluoroscopy was greatly simplified by this convenient dressing.

The material used is usually available.

Union was complete in four weeks without deformity.

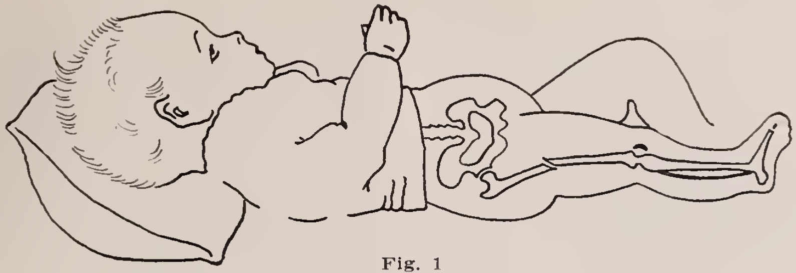


Fig. 1

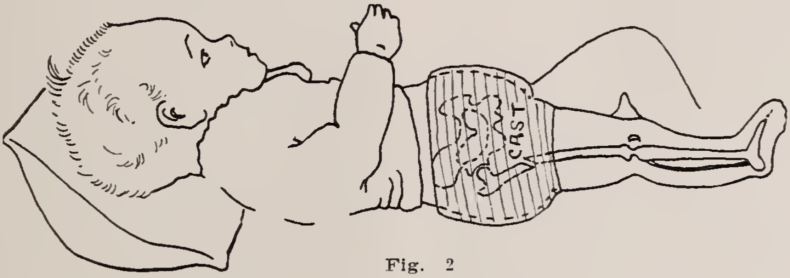


Fig. 2

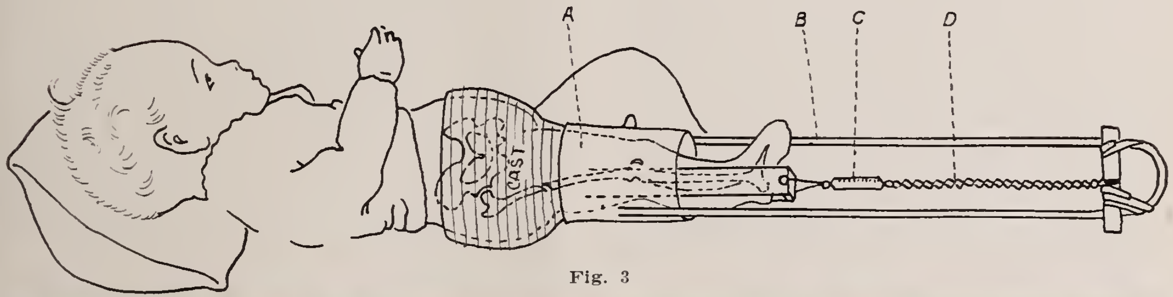


Fig. 3

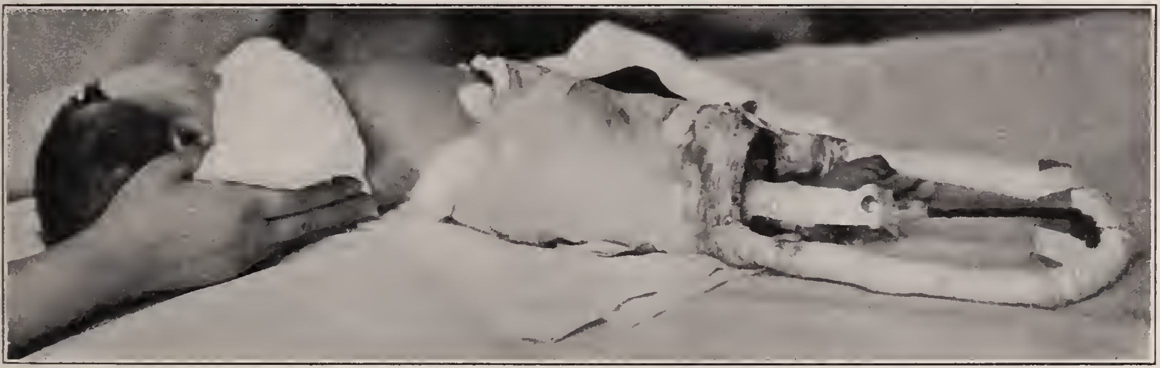


Fig. 4

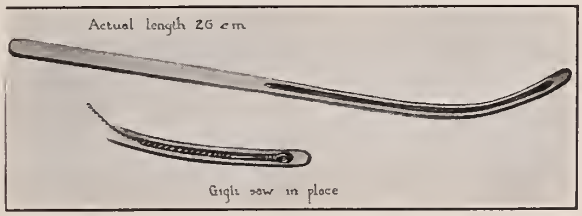
## PRACTICAL GIGLI SAW CARRIER

Dorrell G. Dickerson, M.D.
SEATTLE, WASH.

This carrier is simple, inexpensive; possesses flexibility; is safe and practical. It is constructed of copper and can be bent at any desired angle. As illustrated, the groove is deep enough to house the gigli saw and the notch just behind the blunt head holds the loop in place.

The blunt, smooth head serves as an efficient dural separator and insures separation of the dura from the inner table without danger of tearing the dura. On account of the rounded edges, there is no danger of tearing the dural vessels during the passage of the carrier.

In sawing out a bone flap the carrier can be left in place and prevents any possibility of the saw injuring the dura. It is held by an assistant, the long handle enabling the hand to be held away from the saw.



**NORTHWEST MEDICINE**
**The Journal of the State Medical Associations of Oregon, Washington and Idaho**
**Devoted to the Interests of the Medical Profession of the Pacific Northwest**

**Editorial Office, 543 Stimson Building, Seattle, Wash.**

FEBRUARY, 1930

# EDITORIAL

## HEALTH CONDITIONS IN UNITED STATES

The recent summary of health conditions in the United States during 1928, submitted to Congress by Surgeon General Cumming of the Public Health Service, contains many interesting data which could profitably be considered by all citizens. The birth rate for 1928 was lower than for 1927, the respective figures being 19.7 and 20.7 per 1,000, while the death rate was higher, being 12.1 per 1,000 for 1928 as compared with 11.4 for 1927. The infant mortality rate was also higher, being 67.9 per 1,000 births for 1928 against 64.6 for 1927.

This increased death rate for 1928 is mainly accounted for by the influenza epidemic of that year. Being first reported on the Pacific Coast, it spread rapidly to the East, reaching its maximum for the whole country about the first of the year 1929. In many parts of the country the disease was so mild that physicians hesitated to report it as influenza, yet the general death rate rose far above normal during the epidemic.

The most disgraceful death rate in this country is the prevalence of smallpox. During 1928 there were 38,000 cases reported, an increase of 3,000 over the previous year. It is a strange situation that year after year more cases of smallpox are reported in the United States than in any other country in the world except British India. Yet it is common knowledge that by vaccination and revaccination the disease could be stamped out in a few years, if there were cooperation on the part of the public. More cases of cerebrospinal meningitis were reported than in any year since 1918. This disease appears to increase and decrease during several years duration and for the last five years has been increasing.

The year 1928 showed a new low death rate for typhoid fever. While at the beginning of the present century this disease was responsible for 34 deaths per 100,000 population, during 1928 forty-three states gave a death rate of only 4.8 per 100,000. This record is a tribute to the practical application of the principles of modern sanitary science as carried out by health officers and others interested in sanitation. A similar report is made concerning tuberculosis which, during 1928, presented the lowest death rate recorded for this disease by the Public Health Service. While in 1900 in the death registration area the death rate from tuberculosis was more than 200 per 100,000 population, during 1928 this was reduced to 77.5. Though pellagra is a rare disease in the states of the Northwest, in some Southern states its death rate ranges from 50 to 42 per 100,000 population. Reports show that undulant fever is much more prevalent than formerly realized. At least 649 cases of this disease were recognized during 1928. Tularemia has become a well recognized disease, 480 cases with eight deaths having been officially reported, while many other additional cases were known to have existed. These annual reports from the Public Health Service provide a valuable contribution to the knowledge of the conditions of disease in this country.

## MEMBERSHIP IN STATE ORGANIZATIONS

At the meeting of the American Medical Association in Portland last July, Dr. Olin West, secretary of the Association, in his annual report to the House of Delegates presented a table, showing the percentage in each state association of its membership to the licensed physicians of the state. New Hampshire appears at the head of the list with 87 per cent membership and District of Columbia at the foot with 35 per cent. Washington is twelfth with 72 per cent, while Oregon stands forty-seventh with 49 per cent and Idaho forty-eighth with 45 per cent. One naturally inquires why this variation in adjacent states. The explanation probably lies chiefly in the methods of financing the state organizations, which present an interesting field for speculation. The Washington system provides for the payment through the treasurers of the county societies of five dollars per member as state association dues. Each county society collects dues for its own purposes, ranging from a minimum of a few dollars per member to a maximum of twenty-five dollars in King County for those who have been in practice for more than six and less than twenty-six years, the fee for the two latter groups being sixteen dollars, this fee also including that for the state association.

In contrast to this system the Oregon state society has annual dues of twenty dollars per member, which includes membership in the public health league and medical defense fund. This sum is paid directly to the treasurer of the state society without reference to the county societies, each of which collects dues for its own purposes. In the Idaho association where a similar plan is followed, the dues are forty dollars per year, all members likewise doing their share in supporting the public health league and medical defense fund. If all members in Washington had membership in these two organizations, their dues would be increased by the sum of thirty dollars. At the present time these memberships are optional, so that all do not participate as in Oregon and Idaho. If these items were included in the annual dues, probably there would be a noticeable decrease in the Washington membership, as is noted in the other states. The question of voluntary or required support of these important additional organizations has been a subject of considerable controversy in the states where they exist. It is not intended at this time to discuss this matter but to offer this explanation for the different percentages of membership in the state organizations observed in these three adjacent states. If the members in Oregon and Idaho were materially increased in number, the amount of state dues would doubtless be proportionately decreased, while if a greater number of Washington members were to support the public health league and medical defense fund, the cost to each for these purposes would be correspondingly less.

## CORRECT NOMENCLATURE

During recent years medical terms have been multiplied in such astonishing numbers that no one individual can be expected to keep pace with all of them. The latest editions of medical dictionaries announce the introduction of several thousand new words, with the exclusion of those that have become antiquated. Nevertheless an observant and scholarly writers desires to exhibit familiarity with new words and their correct terminology to as great an extent as possible, and therefore he will aim to follow accurate nomenclature. Yet it is well known that large numbers of physicians are extremely careless in the pronunciation, spelling and phraseology of medical terms. One of the words most widely employed in incorrect usage is x-ray. When Roentgen discovered the mysterious emanations from the vacuum tube whose characteristics were unknown, they were named "x" to indicate their unknown qualities. The word x-ray was soon expanded and came to be employed as an adjective, verb and noun with several meanings, regardless of the commonly accepted terminology of English speech. The following sentence might represent its careless use. "The x-ray man, having determined to employ x-rays, proceeded to x-ray the broken limb, thus producing an x-ray of the site of the fracture." What a nightmare this must appear to the meticulous grammarian. To remedy this objectionable situation the grammarians have established a group of terms based on roentgen as the root, which meet all requirements of correct English expression. Thus the above sentence would be expressed as follows. "The roentgenologist by making use of roentgen rays proceeded to roentgenize the broken limb, thus obtaining a roentgenogram of the site of the fracture." If one considers roentgenogram a clumsy word it can be abbreviated to roentgram which will also be correct. When one consults the most recently published medical dictionary, he will find "x-rays" dismissed with three words, "see roentgen rays," thus abolishing it as a medical term.

One might be puzzled as to the use of the hyphen in these words. The rule established is that, used as nouns, roentgen ray and roentgen rays omit the hyphen. When employed as an adjective the hyphen is employed. One could thus speak of roentgen-ray therapy. In the interests of simplicity, however, it is preferable to omit ray in the adjective and speak of roentgen therapy. This usage is based on the recommendations of the Subcommittee on Nomenclature to the Section on Radiology of the American Medical Association, which was published in *The Journal* September 29, 1928. The following extracts from the report appeared on this occasion:

> As "roentgen therapy" is preferable to "roentgenologic therapy," so we prefer "roentgen diagnosis" to roentgenologic diagnosis." As "roentgen" is being advised as a prefix, it seems unwise to combine "ray" with it. For example, "roentgen diagnosis" and "roentgen therapy" seem more logical than "roentgen-ray diagnosis" or "roentgen-ray therapy."
>
> The use of the word "x-ray" should, in a broad sense, be limited to its application to physical problems and to apparatus, as the "x-ray tube" and "x-ray apparatus." The singular form, x-ray, should be used as an adjective, as x-ray tube, and the plural form, x-rays, as a noun to indicate the radiant energy emitted by the x-ray tube. One should never state, for example, that "the x-ray has many practical applications," but, rather, "x-rays have many practical applications."

## THE WOMAN'S AUXILIARY

The Woman's Auxiliaries of the American Medical Association and state medical associations are in a position to take an active part in advancing the interests of public health and other enterprises with which the medical profession is associated. Results obtainable depend upon personnels of the different organizations and the objects inspiring them to activities. The Auxiliary of the American Medical Association has adopted certain plans and purposes, the carrying out of which aim to promote public welfare and good health of the nation. These are set forth as presented on page 88 of this issue. Woman's auxiliaries exist in connection with the Oregon and Idaho associations but there is none for the Washington organization. It is well known that women are successful as a rule in perfecting any enterprise in which they are earnestly engaged. Therefore, the details outlined in this communication are worthy of the careful consideration of all physicians.

## REVISION OF THE PHARMACOPOEIA

Every ten years an edition of the Pharmacopoeia of the United States of America is published, containing a wealth of information essential for the successful practice of medicine and the promotion of information among the medical profession. The Eleventh Decennial Convention will meet in Washington, D. C., May 13. The constitution of this convention specifies the personnel of its membership. The states of the Northwest officially come in contact with this gathering through authorized memberships from incorporated medical colleges, incorporated state medical associations and incorporated pharmaceutical associations. If the physicians in our section of the country desire to aid in the advancement of medical science by cooperating in this enterprise, it might be advisable to consider delegates representing the respective state associations for the purpose of participating in the deliberations of the convention.

## MEETING OF THE AMERICAN COLLEGE OF PHYSICIANS

The fourteenth annual meeting of the American College of Physicians in Minneapolis this month will be one of the important gatherings for medical men of this country. As this organization has developed, it has included the outstanding and leading internists of all sections. Whatever specialty any physician may follow, he must be grounded in the principles of internal medicine and what is comprised under this heading is a part of his daily practice. Hence the subjects discussed at this great gathering will be of interest to every practitioner, whether in general practice or following some special line. Those privileged to attend this meeting should take from it much that will be of service in the general practice of their profession. The program includes men from all parts of our country and from Canada. Our Northwestern states will be represented by papers presented by Drs. Ralph C. Matson of Portland and Frederick Epplen and J. L. Jacobson of Seattle.

# MEDICAL NOTES

The Fifth International Congress of Physiotherapy will be held at Liege, Belgium, Sept. 14-18. Full members will include doctors in medicine and science, who alone will have the right of reading papers and participating in discussion. Associate members will include delegates from various institutions, as well as manufacturers of apparatus and wives of full members. Papers will be presented in five sections, including physical education, hydrology, climatology, electrology and actinology. Every speaker may use his native language, but they will be requested to speak in a language understood by a majority of those present. Sailings have been reserved for members who desire to attend the Congress. Information relative to sailings and the Congress itself can be obtained from Dr. William B. Snow, 1650 Broadway, New York City.

## OREGON

Health Board Meets. The Oregon State Board of Health held one of its regular meetings in Salem, Jan. 14. Dr. W. P. Morse of Salem was elected president of the board to fill the vacancy due to the death of Dr. Harold C. Bean. It was voted to cooperate with the Commonwealth Fund of New York which has offered to aid in the establishment of full time county health units in the state.

Health Board Member Appointed. Governor Norblad on Jaunary 8 announced the appointment of Dr. M. E. Irvine of Lebanon as a member of the state board of health to succeed the late Dr. Harold C. Bean.

Appointed to Health Board. Dr. H. H. Foskett, of Portland, has been appointed a member of the state board of health. He succeeds Dr. C. J. Smith, whose term has expired.

Retires from Practice. Dr. F. W. Cummings of Eugene recently announced his retirement from active practice. He has lived in Eugene for the past twenty-one years.

Dr. L. F. Griffiths, chief of the medical staff at the Oregon State hospital in Salem, was confined recently by illness at the Portland Medical hospital.

Portland City and County Medical Society met in the Medical building auditorium Jan. 15. The guest of honor was Dr. Arthur C. Scott of the Southern Surgical Association from Temple, Tex., who spoke briefly on the subject of cancer.

Jackson County Medical Society held its annual banquet at Hotel Medford in Medford, Jan. 15. Dr. W. W. Holt acted as toastmaster. Wives of the members were guests of the society. Among those who made after-dinner speeches were Dr. R. E. Green of Medford, president-elect; Dr. E. B. Pickel, Medford, and Dr. D. M. Brower of Ashland.

Staff President Elected. Dr. M. H. Smith of Astoria has been elected president of the medical staff of the Columbia hospital of that city.

Dr. O. O. Alenderfer has been elected president of the staff of the Community hospital at Medford.

Wedding. Dr. Darrel C. Bollam and Miss Helen Bernice Benson, both of Portland, were married in that city, Dec. 30.

## WASHINGTON

Postgraduate Lectures Announced. The list of lectures has been announced for the annual University of Washington postgraduate medical course, which is to be held in Seattle July 10-18. The four speakers are Dr. Edmund Starr Judd, of the Mayo Clinic, Rochester, Minn.; Dr. Thomas Addis, professor of medicine at Stanford University Medical School, San Francisco, Calif.; Dr. Karl Meyer, director of the Hooper Foundation, San Francisco, Calif., and Dr. Joseph Brennemann, chief of staff of the Children's Memorial hospital, Chicago, Ill.

Low Diphtheria Death Rate. Dr. E. T. Hanley, Seattle commissioner of health, has called attention to a new record for diphtheria mortality with only two deaths from this disease during 1929. The record of four diphtheria deaths in 1928 was the lowest figure for any city of Seattle's population during the year. This remarkable result is attributed to stringent quarantine regulations and segregation of germ carriers.

The Smallpox Situation. An increase in smallpox prevails in all sections of the country. Washington is no exception. During the first week of January the number of cases reported was double that of the previous year. The Public Health League is attempting to stir up interest in the subject of vaccination. For this purpose it has sent to all physicians a supply of stickers containing the slogan, "Smallpox is increasing. Vaccination prevents." It is requested that they make use of these on all forms of communications to their patients.

New Hospital Announced. Final plans have been drawn and construction is expected to be completed early in the new year on the $35,000 general hospital at Anacortes. The hospital project, which was started by the Anacortes American League post, has been financed by the sale of stock to citizens of the community.

Veterans' Hospital Head Named. Dr. Harry Rubin recently arrived in Tacoma to assume charge of the United States Veterans' hospital at American Lake. He succeeds Dr. Eugene St. Antoine. Dr. Rubin was formerly attached to the Veterans' bureau at Palo Alto, Calif., as clinical director.

City Physician Appointed. Dr. William M. Lee, formerly connected with the Columbus hospital in Seattle, has been appointed physician to the Spokane health department to fill the vacancy caused by the death of Dr. David H. Ransom.

Coroner's Aid Appointed. Dr. Allen P. Hughes, of Auburn, has been made resident deputy coroner of King county. He succeeds Dr. M. J. Lacy who is leaving Auburn.

Aviation Officer Named. Dr. H. A. Barner of Bremerton has been appointed medical officer for aeronautics in the local district, under the direction of the Department of Commerce.

President of Staff. Dr. C. A. Veasey, Jr., has been elected president of the staff of St. Luke's hospital, Spokane.

Dr. J. W. Henderson of Longview is convalescent from an operation for appendicitis, performed in Spokane Dec. 26. He was stricken on Christmas day while visiting relatives in Colville.

Dr. George T. Henwood of Deer Park has been confined to a Spokane hospital by a severe illness.

Retires from Practice. Dr. J. W. Straight of Mt. Vernon has retired after having spent ten years in practice in that city. After a trip to California he intends to make his home in Mt. Vernon. His practice has been taken over by Dr. Clarence E. Kjos, formerly resident at the Brooklyn (New York) Eye and Ear hospital.

Dr. Minnie Burdon of Seattle left recently for Europe, where she will spend several months in postgraduate study at Vienna and other medical centers.

Dr. W. M. Karshner of Puyallup, accompanied by his wife, sailed early in February from New York for a cruise of the Mediterranean.

Dr. W. I. Firey, formerly of Phoenix, Arizona, has opened offices in the Brooklyn Building, University district, Seattle.

Seattle Surgical Society held its annual meeting at Seattle, Jan. 17-18. The guest of honor was Dr. Arthur C. Scott of Temple, Texas, whose work on surgical removal of cancerous tissues by actual cautery has attracted world wide attention. He gave several addresses on surgical subjects and conducted a clinic. A clinical demonstration of patients was also given by members of the society. A banquet at the Olympic hotel culminated the program. Dr. D. V. Trueblood is president of the society and Dr. Paul Gunby secretary.

Lewis County Medical Society held election of officers at a banquet meeting at St. Helens hotel in Chehalis Jan. 17. The following were chosen: President, H. L. Petit of Chehalis; vice-president, H. B. Cravens of Pe Ell; secretary-treasurer, Rush Banks of Centralia.

Clark County Medical Society held the regular monthly dinner and meeting at the Evergreen hotel in Vancouver Jan. 14. Dr. J. Earl Else of Portland, Ore., was the guest of the society and delivered an address.

Wedding. Dr. Harold J. Greer, of East Stanwood, and Miss Esther Leola Urstad, daughter of the late Dr. Oscar Urstad of East Stanwood, were married in Seattle Dec. 26.

## IDAHO

Hospital Remodelled. Extensive improvements to the private hospital of Dr. R. A. Lower at Priest River have recently been completed, converting it into a modern institution with surgical and roentgen-ray facilities of the latest type.

Hospital at Cottonwood Planned. A committee of citizens of Cottonwood have recently been engaged in soliciting funds for the establishment of a modern hospital in that city. It is stated that the new institution is now assured. It will be managed under the direction of St. Gertrude's convent, which owns a building that is to be remodelled for hospital purposes.

**South Side Medical Society** met in Twin Falls, Jan. 15. A scientific program took place. Election of officers for 1930 resulted as follows: President, Dr. W. F. Passer; vice-president, Dr. H. W. Clouchek; secretary-treasurer, Dr. H. N. Leete, all of Twin Falls.

**Dr. Leland Frazier** of Rupert has moved to Burley where he will engage in practice.

## OBITUARIES

**Dr. Harold Cedric Bean**, Portland, Ore., president of the State Board of Health and prominent internist, died at the Good Samaritan hospital following an operation, aged 40 years. He was born in Eugene, Ore., in 1889 and graduated from The Johns Hopkins University School of Medicine, Baltimore, Md., in 1916. He served with the Canadian army in the World War, later being transferred to the American Expeditionary Forces, when the United States entered the conflict. On his return from France he practiced for a short time at Happner and subsequently moved to Portland. He occupied the position of assistant clinical professor of medicine at the University of Oregon Medical School.

**Dr. Allen Pendleton Noyes**, Portland, Ore., died at the Good Samaritan hospital in that city Jan. 8, following a prolonged illness, aged 40 years. He was born in Astoria, Ore., in 1889 but spent his early youth in Portland. He graduated from the University of Oregon Medical School in 1912. After several years of postgraduate study in the East he returned to Portland, where he became associated with Dr. E. J. Labbe in the practice of obstetrics and gynecology. He was a member of the faculty at his alma mater.

**Dr. Menzo B. Mattice**, pioneer physician of Sedro-Woolley, Wash., died at the Memorial hospital in that city Dec. 25, following an illness of but a few hours, aged 74 years. He was born in Albany, New York, in 1855, and graduated from Albany Medical College in 1881. He located at Sedro-Woolley in 1889 and practiced almost continually there until his retirement three years ago.

**Dr. Albert F. Isham**, a pioneer physician of Caldwell, Idaho, died at his home in Long Beach, Calif., Jan. 7. He was a graduate of the University of Vermont College of Medicine, Burlington, Vt., in the class of 1882. He located at Caldwell in 1883 as surgeon for the Union Pacific railroad. He remained in active practice for many years, at the same time carrying on other business activities. At one time he served as mayor of Caldwell.

**Dr. George Osman Keck**, Lapwai, Idaho, for the past eight years in charge of the sanitarium at the Nez Perce Indian agency, died suddenly, Jan. 12, aged 54 years. He was born in 1875, and graduated from Jefferson Medical College, Philadelphia, Pa., in 1900. He was engaged in sanitarium work in the East for several years before coming to Idaho. He also practiced for several years in Hoquiam, Wash.

**Dr. Daniel R. Coryell**, Myrtle Creek, Ore., died at his home Jan. 2, following a long illness, aged 72 years. He was born at Vernon, Ill., in 1857, and graduated from Willamette University, medical department, Salem, Ore., in 1883. He had practiced at Myrtle Creek for the past fourteen years.

**Dr. Howard Searight**, pioneer physician of Clayton, Wash., died at his home in Spokane Dec. 29, aged 71 years. He was born in 1858, and graduated from Western Reserve University School of Medicine, Cleveland, Ohio, in 1882. He had resided in Spokane for the past fifteen years.

**Dr. Edwin P. Wallace**, retired physician of Cusick, Wash., died at Spokane Jan. 6, aged 81 years. Since his retirement in 1921 he had resided in Spokane.

## OFFICIAL HEALTH PROGRAM OF THE WOMAN'S AUXILIARY OF THE AMERICAN MEDICAL ASSOCIATION

### I. PUBLIC HYGIENE

Fundamentals upon which auxiliary work for improvement of public hygiene should be based:

1. Recognition of the fact that public health work is a highly technical job, requiring scientific, technically trained workers. That health work undertaken by lay women with no knowledge of the public health problem as a whole is necessarily fragmentary and ineffective.

2. Recognition of the fact that every state, county and city is entitled to a scientific full-time health department (organized not to treat the sick, but to prevent disease and promote health), adequately financed, free from political domination, and providing continuity of service to a trained personnel so long as work is efficient.

3. Recognition of the fact that the first and most fundamental job for lay organizations like the auxiliary is to secure such scientific full-time health departments and adequate health protection in their states, their counties, their cities or towns.

4. Recognition of the fact that where efficient, full-time, scientific health departments do not exist (and only about ten per cent of the rural districts of the United States have anything approaching adequate health protection), health activities must be initiated and carried on by volunteer unofficial agencies; but that all such work should be so planned and administered as to serve as stepping stones toward the full-time official health department, and that when the full-time official health department, with workers trained for public health work, has become an accomplished fact, lay organizations should support and cooperate with the official workers and should be willing to take orders from them.

5. Recognition of the fact that no health department, state, county or city, can do effective work without intelligent cooperation of the public; that such public cooperation depends upon widespread health education; that lay organizations can do this educational work, and are needed for it; and that the auxiliary can be one of the most valuable tools for an official health department to use in this work, because it can, by its education of the public concerning official health department's work and needs, be the means of gradually eliminating or preventing political interference with an efficiently working department, and thus insure to it uninterrupted service.

Most volunteer agencies do not yet realize the wastefulness of their individualistic efforts. One of the first things the auxiliary should do is to work for a change of attitude in other volunteer women's organizations.

Health officials know that it is not always the work which makes the greatest emotional appeal to the public which most needs to be done. Unfortunately most women do not know this. This is something the doctors' wives might well undertake to teach other women.

The National Auxiliary recommends, therefore, that each State Auxiliary undertake, under the direction and with the help of the Public Health Committee of the State Medical Association and of its Advisory Council a study first of all of the fundamental principles of health promotion and disease prevention; second, of the set-up considered essential by public health experts for an effective state health department, of qualifications of personnel, adequate budget and the like; and, third, of the state health conditions; that it devise means of acquainting all the state board members with the result, and that recommendations for educational work by the county auxiliaries be based upon the conditions found.

In states where all is well and time has developed good official health machinery and good health conditions, general knowledge of the fact will tend to prevent interruption of the excellent work, and will be a source of satisfaction to the women of the state.

In those states where there is much yet to be done, this investigation will indicate what sort of work needs doing first. For example:

a. In those states which are not in the Birth Registration Area, the auxiliaries would without doubt wish to tackle as their first job the ninety per cent birth registration problem.

b. In those states in which the state health department believes the "County Health Unit" to be the solution of the rural health problem, the county auxiliaries should be encouraged to take as their chief work such persistent and widespread education of the public as will gradually create a general demand for the full-time county health department.

c. In those states where the rural health work is directly done, "long distance" by the state health department, the county auxiliaries, if willing to work, and work under the directions of the state health department, can carry on intensive local health education work which would be impossible for the state department without intelligent local cooperation.

To those auxiliaries which agree with these ideas the committee recommends the following outline of study:

1. Vital statistics. Their value. Compare the vital statistics of the state with those of other states. Compare the vital statistics of the different counties of the state. Compare the vital statistics of the cities with other cities in the state, and in the United States.

2. The State Health Department; its organization and program: a. For general state work. b. For cooperating with the counties in improving county health conditions.

3. The value of the Public Health Nurse.

4. The County Health Unit as a possible solution of the rural health problem.

*Community-wide Conditions Which Affect Health*

5. Milk: Milk standards, why necessary, what milk standards your community needs. How are these needs being met?

6. Housing: Your community housing laws. Housing conditions as they have developed under these laws and as they affect health. Improvements needed.

7. General sanitation and its relation to the death and morbidity rates. Sewage disposal. Water. Garbage. Flies. Dust and street cleaning, etc.

### II. PERSONAL HYGIENE

The improvement of personal hygiene in any community is almost entirely a matter of education. Here again the auxiliary members must first educate themselves before they can take a safe part in educating the public. The committee, therefore, recommends that the auxiliary study programs shall include such subjects as health promotion, prenatal care, child welfare, infant and preschool hygiene, school hygiene, mental hygiene, social hygiene. The advantage to the public of general compliance with health regulations. The periodic health examination. Control of communicable diseases.

The entire program should close with a survey of all the private agencies doing health work in the community, and a discussion of the possibility and desirability of centering the direction of all such work in a full-time, scientific health department, under which the private agencies, while still maintaining their identity, would work in complete cooperation.

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## MODEL HEALTH EDUCATIONAL CENTER INSTALLED AT EUGENE, ORE.

The beginning of the new year marked the establishment of a model health educational center for Lane County and further recognition of Eugene as the center of the central Willamette Valley. The new center, which was established through the combined efforts of the Lane County Medical Society and the Southern Willamette District Dental Society, is located in attractive offices at 865 Olive Street.

The organization, which has been installed by the local medical and dental professions, follows the model "Oregon Plan" of local medical and dental organization, developed by Clyde C. Foley, Executive Secretary of the Oregon State Medical Society. The type of organization is a combined health educational center for the lay public and a centralized cooperative business office for the medical and dental professions. The "Oregon Plan" has worked out so successfully that it has attracted the attention of many of the national medical journals, and inquiries from all parts of the United States are being received in regard to it. The plan is receiving wide recognition as a model system, and organizations similar to the Eugene project are being patterned in many eastern, southern and middle-western states. The adoption of the plan here indicates the progressiveness of Lane County physicians and dentists, inasmuch as Eugene is the first city of its size in the United States to have such an organization.

This plan provides a centralized system for caring for certain business aspects of medical and dental practice through the official societies of the two professions. An up-to-date medical and dental society has three functions. First, the postgraduate education of the physician and dentist, which means keeping the busy physician and dentist abreast of the great progress constantly being made in medical and dental science; second, the education of the lay public as to the aims of medical and dental science, and to an intelligent understanding of the simple rules of healthful living, as well as to a sound discrimination between the scientific methods of the trained physician and dentist and the unscientific treatments and nostrums of the charlatan; and, third, the carrying of certain business services for physicians and dentists which can best be handled by cooperative effort through their own professional societies.

These three functions, which in many other cities and states are handled through numerous independent, overlapping organizations and activities, are coordinated with all services and activities centralized under the official direction of the medical and dental societies. This has never been done elsewhere. This society was the first to use this centralized system. The dentists of the state have recently joined the doctors in this cooperative organization, which now serves the dental as well as the medical profession in all its departments. The feature of this new headquarters, in which the public will be most interested, is the free public health information bureau and reading room. This bureau makes available a wide variety of reading material including health books, magazines, posters and pamphlets on such topics as the care of the teeth, posture, play, diet, annual health examinations, care of the baby, personal and home hygiene. The bureau also has available many pamphlets and posters exposing various forms of quackery and worthless patent medicines.

Another function of this bureau will be to safeguard the public against charlatans and quacks by supplying biographic data concerning the training of doctors and dentists and furnishing lists of members of the medical and dental societies who are engaged in various special branches of practice. This information is made available through the Oregon Medical Blue Book, the official hand-book of the medical profession of the state, which is published by the Oregon State Medical Society.

The new public health information bureau is also prepared to consult with governmental officers and welfare organizations in matters relating to public health. In this way the knowledge of the trained physician and dentist will be available to the community to assist in the solution of its health problems. The bureau will likewise be ready to assist teachers and schools in planning health instruction and in supplying materials for school health study. Clubs, churches and other groups are free to call upon this bureau for assistance in planning programs of health talks and motion pictures through a speaker's bureau, consisting of members of the medical and dental societies.

The business services of the new medical and dental headquarters include a collection and credit bureau, in which the physicians, dentists, nurses and hospitals will cooperate in maintaining a clearing house of credit information; an employment registry for nurses, technicians and office assistants; a professional information bureau, through which the queries of physicians and dentists regarding opportunities for graduate study, the interpretation of state and federal regulations, etc., are answered; and a medical and health book and stationery department which handles medical books and journals, and various printed forms used in the offices of physicians, dentists and hospitals.

Within a very short time a doctors' and dentists' day and night telephone exchange will also be installed. This will have detailed information as to the whereabouts of every physician and dentist member and thus make it possible for the people of Eugene to keep in touch with their doctors and dentists both day and night every day in the year. Another function of this emergency exchange will be to locate and send out the patient's family doctor in cases of sudden night emergency. In this way the people of Eugene will be certain of being cared for promptly in any extremity which may arise. New features will be added to Eugene's health center from time to time, for the whole organization is most flexible and stands ready to adopt whatever measures will best fulfill the responsibility of the organized medical and dental profession to the public.

The new health center will be the official headquarters of the Lane County Medical Society and the Southern Willamette District Dental Society and their scientific and business meetings will all be held here. Officers of the medical society who have been active in the organization of the new project are Dr. Irvin R. Fox, President, Dr. C. D. Donahue, Vice-President, and Dr. Harry G. Talbot, Secretary. Officers of the dental society who have cooperated with the physicians are Dr. W. E. Moxley, President, and Dr. Wright B. Lee, Secretary. Eugene also has the distinction of having three officers in the state medical and dental associations; Dr. E. L. Zimmerman, Vice-President of the State Medical Society, Dr. William Kuykendall, who is a member of the council of the State Medical Society and state delegate to the American Medical Association, and Dr. C. B. Willoughby, President of the State Dental Association.

The new health center will be under the direction of a committee of physicians and dentists consisting of Drs. Charles E. Hunt, Chairman, L. S. Kent, retiring President of the Lane County Medical Society, E. L. Zimmerman, Wright B. Lee, S. L. Schwering, and W. N. Dow of Springfield. The organization wil be under the general supervision of Clyde C. Foley, Executive Secretary of the Oregon State Medical Society. Clarence L. Fitzwater, whose family are old-time Lane County residents, will act as field representative for the new organization. Maud Van Carmen will be in charge of the office. The reading room and public health information bureau will be conducted under the direction of Mrs. David T. Bauman, a recent graduate of the scientific department of the state university here.

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CYSTITIS EMPHYSEMATOSA. The four cases of cystitis emphysematosa in women, with the case histories and essential observations at necropsy, reported by Ralph G. Mills, Rochester, Minn. (*Journal A. M. A.*, Feb. 1, 1930), provide a basis for comparison and analysis, thus making it possible to detect important etiologic factors. Cystoscopic examination had been performed in one patient only eighteen days before death, without the presence of vesicles being detected, if they existed at the time. Two other patients had nephritis, and the fourth was without urinary symptoms of any kind. The presence of marked evidence of cystitis, both acute and chronic, and of hemorrhage, both recent and old, indicates conclusively that cystitis had existed for a considerable period before death. It would be impossible to decide whether the gas vesicles developed early or late in the inflammatory process. The author feels that cystitis emphysematosa should be considered a pathologic entity, but it remains to be determined whether or not it is a clinical condition, and if so of what significance.

# REPORTS OF SOCIETY MEETINGS

### NORTH PACIFIC PEDIATRIC SOCIETY

The midwinter meeting of North Pacific Pediatric Society was held Jan. 25 at Seattle, president W. F. Patrick, Portland, presiding. Thirty members and guests were in attendance.

The morning session, at the Children's Orthopedic hospital, was devoted to scientific papers.

Dr. C. F. Eikenbary of Seattle gave an address, illustrated by motion pictures, on the treatment of tuberculosis of the hip by fusion.

Dr. Herbert Coe of Seattle displayed patients exhibiting the end-results of cleft palate operations.

Two cases of pachymeningitis hemorrhagica interna were described by Dr. Norman Clein of Seattle, while Dr. Jas. W. Rosenfeld of Portland gave the clinical x-ray autopsy findings in an infant with congenital dilatation of the uterus.

Dr. D. M. Dayton of Tacoma described his experiences in the use of luminal for the control of infantile pylorospasm.

Following a luncheon at Boulevard Inn, at which those present were the guests of the Seattle Pediatric Society, the meeting was resumed at the Olympic hotel.

Dr. Arthur Gray of Seattle discussed "The Cause, Symptoms and Treatment of High Acid Urines Not True Acidosis."

Dr. E. J. Barnet of Spokane talked on "The Use of Luminal in Infant Feeding," his paper and that of Dr. Dayton being discussed together.

A paper on "Congenital Syphilis, Some Interesting Features," by Dr. C. F. Covernton of Vancouver, B. C., was read by title.

Dr. Laurence Selling of Portland, a guest of the society, talked on "Recent Views on Tic," in which he called attention to the fact that a considerable proportion of these cases are really organic in nature and are the result of a previous infection in the region of the striate bodies of the brain.

A banquet at the Olympic hotel ended the meeting. Dr. H. H. Skinner of Yakima gave a travelogue, illustrated by motion pictures, on his recent visit to hospitals and pediatricians in Japan, Russia and Western Europe.

## OREGON

### POLK-YAMHILL-MARION MEDICAL SOCIETY

Pres., D. R. Ross; Secty., W. W. Baum

Polk-Yamhill-Marion Medical Society held its annual meeting at Salem, January 7. The following officers were elected for the year 1930: President, Dr. G. C. Knott, Independence; Vice-President, Dr. F. K. Power, Salem; Secretary-Treasurer, Dr. W. W. Baum; Counselors, Drs. F. R. Bowersox, Monmouth, and H. K. Stockwell, Salem.

The program of the evening was a paper by Mr. Andrew Miller, Secretary of the Westcoast Bancorporation, Portland, on "Investments."

### PORTLAND CITY AND COUNTY SOCIETY

Pres., F. A. Kiehle; Secty., H. P. Rush

Portland City and County Medical Society met at the Medical-Dental Building auditorium, Portland, Jan. 15. Dr. J. Guy Strohm delivered an address on the subject of "Kidney Stone and Allied Conditions." Dr. Franklin P. Johnson talked on "Hydronephrosis." "Some Points in Kidney Pathology" was discussed by Dr. C. H. Manlove.

## WASHINGTON

### GRAYS HARBOR COUNTY SOCIETY

Pres., H. L. Hall; Secty., K. D. Graham

Grays Harbor County Medical Society held its annual meeting last month at Aberdeen. The following officers were elected for 1930: President, E. B. Riley, Aberdeen; vice-president, A. M. Skarperud, Aberdeen; secretary-treasurer, L. R. Lightfoot, Aberdeen; censor, J. B. Kinne, Aberdeen. Representative to State Medical Association annual meeting, A. E. Anderson, Aberdeen; alternate, H. C. Randolph, Aberdeen

### JEFFERSON COUNTY MEDICAL SOCIETY

Pres., J. F. Delaney; Secty., H. C. Miller

A general meeting of Jefferson and Clallam counties societies was held at the Marine Hospital, Port Townsend, January 21. Eighteen physicians were present from the two counties. The following program was presented after the dinner. The papers read and the cases reported were by the staff of the United States Marine Hospital.

"Gonorrhea, Some of Its Effects." Dr. Ralph Gregg.

"Syphilis, Incidence and Effects." Dr. Paul W. Spickard.

"Pulmonary Lesions, with Brief Discussion of Typical Cases Illustrated by Roentgen Rays." Dr. Harold D. Lyman.

"Appendicitis. Findings in Fifty-nine Consecutive Cases with Pathology Confirmed by Laboratory Findings." Dr. O. H. Cox.

### KING COUNTY MEDICAL SOCIETY

Pres., B. T. King; Secty., H. L. Goss

A general meeting of King County Medical Society was held in the auditorium of the Medical-Dental Building, Seattle, Jan. 6, with President B. T. King in the chair. Abount one hundred fifteen members were present. Minutes of the meeting of Dec. 2 were read and approved.

Applications for membership were received from the following: J. L. Ash, J. W. Baker, A. L. Balle, R. B. Bramble, L. H. Edmunds, C. M. Helwig, G. M. James, R. H. Loe, J. K. Martin, J. W. McDowell, F. E. Parsley, V. W. Ritter, D. J. Thorp and J. N. Wilkinson.

Reports were received from the chairmen of the following committees: Program, membership, entertainment, publicity, legislative, welfare, pathology, city health, bulletin advisory, location advisory, university extension, ethics, hospitality. On motion these reports were accepted as read.

The secretary-treasurer gave a report on the income and expenditures of the society for the past year, including its assets and liabilities. The report was duly approved and accepted. Dr. King gave his report as retiring president.

Dr. George E. Price delivered a paper on "Epidemic Encephalitis, Ten Years After." The disease at present is mild compared to the epidemic of ten years ago. The symptoms were classified. There is a marked predominance of the motor symptom group, the Parkinsonian syndrome constituting over half the cases. A group of patients were exhibited, illustrating the principles under discussion.

A letter was read from Fire Marshall Lang relative to the ordinance forbidding the use of inflammable roentgen-ray films. A motion was passed that the president appoint a committee to take up with Fire Marshall Lang the matter of their storage.

Dr. Karl Meyer, professor of bacteriology, University of California, was introduced. He presented observations made during a four month's visit to Europe, while making a survey of public health activities. In Great Britain health officers are considered the medical leaders. Health activities are much superior to those in the United States. Germany is spending large sums on public health service with a vast corps of trained workers, while Austria is doing the same with borrowed money. In Italy marvelous changes are being made in behalf of the improved health of the people. Results of such efforts were cited. Undulant fever as seen in this country is different from that in the Mediterranean. It is found mostly in rural districts. Opinions differ as to the value of vaccine. Dr. Meyer stated that medical instruction is dead in Vienna, while London, Berlin and Switzerland present vastly more material and teachers.

The following officers were elected for 1930: President-elect, D. J. McCurdy; secretary-treasurer, A. J. Bowles; trustees, G. C. Miller and J. T. Whitty.

### PIERCE COUNTY MEDICAL SOCIETY

Pres., C. F. Engels; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in the Washington Building, Tacoma, December 10, 1929. Dr. C. F. Engels in the chair. Minutes of the last two meetings read and approved.

Dr. D. H. Bell demonstrated an audiometer and spoke of its value and use in hearing tests. Discussion by Drs. A. E. Hillis, A. W. Howe and C. V. Lundvick.

A paper on "Sodium Amytal, Its Use in Surgery," was presented by Dr. James H. Eagan, who gave a report on cases in which it had been used at St. Joseph's Hospital. His conclusions were that it is valuable both from the standpoint of the anesthetist and of the patient. This paper was discussed by Drs. L. J. Hunt, G. E. Griffith, W. B. Penney, C. F. Engels and A. W. Howe.

Miss Helen Wilcox, Executive Secretary of the Public Health League, gave a talk on the work of the League and the problems confronting it in the future.

### SKAGIT COUNTY MEDICAL SOCIETY

Pres., W. L. Jackson; Secty., W. N. Hunt

Skagit County Medical Society has elected officers for the ensuing year as follows: President, W. L. Jackson, Burlington; vice-president, R. W. McKinley, Burlington; secretary-treasurer, W. N. Hunt, Burlington. S. W. Holton of Sedro-Woolley was named delegate to the State Medical Association meeting.

### SPOKANE COUNTY MEDICAL SOCIETY

Pres., Carroll Smith; Secty., R. M. Schulte

Spokane County Medical Society held its annual meeting and election of officers at Spokane, Jan. 17. Dr. Carroll Smith, retiring president, occupied the chair.

Officers for 1930 were elected as follows: President, C. B. Ward; president-elect, William Pennock; secretary, Robert P. DeRiemer; treasurer, E. L. Reger; board of censors, E. S. Jennings, R. E. Ahlquist and C. M. Anderson. The board of trustees is composed of R. G. Andres, George Anderson, Carroll Smith, J. G. Cunningham and Frederick Whitaker.

### WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., J. T. Rooks; Secty., C. J. Johanneson

Walla Walla Valley Medical Society held its monthly meeting at the Marcus Whitman hotel, Walla Walla, Jan. 9.

The meeting was largely attended, including the following doctors from Spokane who arrived by airplane: E. J. Lawrence, A. M. Codd, C. B. Ward, E. P. Condon, J. W. Windell, R. E. Shanks, George Hoffman, George Anderson, Joseph Aspray and W. E. Grieve. A banquet preceded the meeting of the society.

Dr. C. B. Ward of Spokane gave an address on "Tumors of the Lips, Both Benign and Malignant." He recommended roentgen ray and radium in preference to surgery for treatment because practically no scars and deformities remain and results obtained are equally as good as from surgery. Motion pictures illustrated cases before and after operation.

Dr. A. A. Matthews of Spokane read a paper on "Methods of Treating Varicose Veins." He featured particularly the injection treatment, calling attention to the rapid healing of varicose ulcers of the lower extremities after this form of treatment.

Dr. J. W. Ingram of Walla Walla discussed "Prostatectomy with End-results." He reviewed twenty cases he had treated during the past two years. He emphasized the importance of adequate examination and study of the case before operation.

## BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

SYNOPSIS OF THE PRACTICE OF PREVENTIVE MEDICINE. As Applied in the Basic Medical Sciences and Clinical Instruction at the Harvard Medical School. Cloth. 194 pp. Harvard University Press, Cambridge, Mass, 1929.

The chief object of the book is to give the medical student information concerning prevention of disease in the individual in connection with his various courses from the beginning in the basic medical sciences to the later work in the main clinical subjects and specialties. As Edsall has noted in his introduction, instruction is now given in special departments teaching preventive medicine applied to the mass of people (Department of Public Health), but teaching prevention of disease in the individual has not entered hitherto sufficiently into the curriculum of all the departments in the school. This volume is intended as a textbook in embryo for suggestions are asked for, and the whole book is interleaved with blank pages for notations leading to its improvement.

The object of the book is unquestionably desirable and laudable but the result is very disappointing, to say the least, as a textbook or even synopsis for general use in medical schools. Each of twenty different departments in the medical school has contributed its quota to the making of the book, apparently without taking much account of what the other nineteen supplied. This has resulted in innumerable duplications and reduplications of matter in the text. Typhoid fever may be taken as an example, although like instances occur throughout the book, which is discussed by the bacteriologist, internist, pediatrist, etc., all with the same viewpoint, prevention of disease. There is in consequence constant repetition.

The teaching is mostly very brief, fragmentary and incomplete, and sometimes contradictory, as when one department insists that vaccination should be done by multiple puncture and the other by oldtime scarification. Moreover, it is impossible to discuss a subject meticulously and thoroughly when one knows a number of others are going to touch more or less casually on the same topic. Nobody feels great responsibility for the result. Then, when a subject is so divided among twenty different contributors, omissions must occur, and they have. This is noticeable in the most important matter of prevention of cancer. No notice has been taken of precancerous conditions of the breast. Under dermatology the danger of malignancy in pigmented moles, keratoses and Paget's irritation of the nipple are omitted, but some allusion is made to the matter under surgery. The subject of prevention of cancer should be treated as a whole by one authority, as Bloodgood has been doing for over a decade.

In works by many authors the chief fault is inequality in ability, style and sense of proportion. The space allotted should depend upon the value of the subject. Harvard has certainly a model of what such a work should be in Christian's Oxford Medicine, so admirable in uniformity of style, in high levels of contributions, and in proper allotment of space to the importance of the subject.

The most distinguished living surgeon in this country today facetiously remarks that, "You can tell a Harvard man anywhere, but you can't tell him much." As the reviewer is a Harvard graduate of the days when J. Collins Warren operated in a long blue frock coat with brass buttons, he may be permitted to do a little telling in the way of suggestions about this book. First, all important subjects should be discussed in a single section under a single department, and references to this subject be made in the text by other departments, instead of discussing it all over again. Second, all the infectious diseases should be included under medicine, and the whole matter of cancer of all parts of the body be considered under surgery because it becomes surgical when discovered. Third, it would simplify the book very much, if the matter now included under anatomy, physiology, parasitology, pharmacology, physical diagnosis and syphilology were omitted under these headings and were incorporated under the major clinical subjects, where they naturally belong when applied in practice. Fourth, the entire book should be revised by one man after securing all available data from each department and each department read what all the others have contributed. The authors of the matter from each department should sign their names to their articles, giving them more authority and making the writers responsible for the statements in the text. All matters are now synonymous, which is not surprising. The book would probably be much improved if such responsibility existed.

Whether sexual hygiene is purposely omitted because of the relics of puritanism lurking in the classic shades of Harvard is uncertain, but it seems a great mistake as incalculable damage is done to persons through ignorance of the same. The reviewer was as ignorant of the subject as a four months' fetus, when he graduated from medical school.

There remain a few minor criticisms to be noted. On page 65 the use of agar is discouraged as "roughage," a rather rough description of a jelly. Concerning periodic health examinations it is emphasized that early diagnosis is essential. In fact, this is the very essence of preventive medicine and should be stressed throughout the book. But in a nation-wide periodic health examination the very men who should do the work, owing to their ability, would probably be excluded by politics and there would be great danger of unduly alarming the people if these examinations were done by inexperienced men, as was so often the case in heart examinations in the army in the late war. Physicians should encourage such examinations among their own patients and families.

Under spinal anesthesia the statement that it is produced "in the lower part of the trunk and legs" should be changed to below the diaphragm. It is ideal for operations on the gallbladder or stomach in many cases. Also its great advantage in operations for intestinal obstruction should be noted in preventing drowning of the patient on the table, or the production of pneumonia from flooding of the lungs by antiperistalsis, as lately pointed out by William Mayo. The discussion of many subjects is omitted or too brief. That of focal infections in the sinuses, teeth, tonsils, prostate and cervix is most important. The department of gynecology occupies but little over a page and devotes but seven lines to prevention of cancer. The symptoms and differential diagnosis of cancer of the cervix and fundus should be briefly but clearly described, and the many cases where a useless uterus should be removed, when a positive diagnosis of cancer of the body is probable from a symptomatic standpoint, but can only be demonstrated by the pathologist.

The prevention of food poisoning should be considered, especially milk. Under pediatrics it is stated that bovine tuberculosis can readily be excluded in certified herds. Perhaps, theoretically, but practically never, as we have found over and over again, and as was demonstrated at the celebrated farm at Montclair. Also it is stated to be a "great question whether to use raw, boiled or pasteurized milk" for infants. This reminds one of Hamlet's "to be or not to be, that is the question," because by boiling milk there will be no question as to being or living. Deficiency diseases should be treated as a whole under a single department and allergy also in asthma, etc.

Taken as a whole this volume, even as a synopsis, is altogether too sketchy, incomplete and unsystematic as a textbook representing one of the great medical schools of the world. One sympathizes readily with the editor who denies this to be a textbook but only a depository for emphasizing points in the curriculum of the Harvard Medical School. Dean Edsall, on the other hand, in his introduction, hopes the book will "prove useful in this and other schools" as "a small collective textbook of preventive medicine." Heaven forbid! But as criticism has been freely asked, it is as freely given. The book can be enormously improved, as at present it seems but a collection of rather casual, random, incomplete suggestions from twenty different departments of the medical school, none of which was sufficiently interested to see that the result reflected credit upon the institution. Compared to the numerous textbooks of many of the teachers in the school it is indeed a travesty. It seems wholly unnecessary, with the aid of all departments of the great Harvard Medical School, that such an undertaking should require outside assistance to produce a wholly admirable textbook on a subject which chiefly depends on large clinical experience of able men and knowledge of well proved scientific medical facts. This criticism is authorized by our motto, "Veritas." WINSLOW.

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STERILIZATION FOR HUMAN BETTERMENT. A Summary of Results of 6,000 Operations in California, 1909-1929. By E. S. Gosney, B.S., LL.B., and Paul Popenoe, D.Sc. Cloth. Price $2.00. 135 pp. with Appendices. New York. The Macmillan Co., 1929.

This monograph deals with the subject of sterilization in all its aspects, compulsory sterilization of the insane and mental defectives, of criminals and voluntary. In the state of California there have been 6,255 official sterilizations in the last twenty years, three times as many as in all the rest of the states, so that this summary of results and conclusions is of value, especially since the research has been in charge of so eminent and well qualified an authority as Mr. Popenoe.

It is interesting to know that Washington adopted an eugenic sterilization law in 1909 which has been in effect ever since but has been virtually unused, there being only nine official sterilizations to date. This is practically the same story in most of the other states, although interest has been revived in carrying out the law, particularly in Kansas, Oregon, Nebraska, Minnesota and Wisconsin.

All aspects of this problem are thoroughly and interestingly covered and the usual objections to sterilization answered convincingly. The importance of this problem is obvious, when we consider that conservatively speaking, four per cent or 4,800,000 of the people of the United States will at some time in their lives need the care of an institution for mental diseases for some form of insanity. When in addition we consider the great mass of feeble minded, anything that can be done, which is sanctioned by good sense and good morals to prevent this accumulation of common misery and degeneration, demands some attention. One of the most interesting parts of this book is that which deals with voluntary sterilization for personal, social or eugenic reasons in those who are not in institutions.

The appendices contain a bibliography, several original papers and discussions and a summary of the state laws and supreme court decisions. This book should be of interest not only to the student of sociology and eugenics but to anyone who is interested in the problem of human betterment. HEPLER.

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THE NECK. By Percy D. Hay, Jr., M.D. With Introduction by Henry K. Pancoast, M.D. Annals of Roentgenology. Edited by James T. Case, M.D., Ex-President of The American Roentgen Ray Society. Volume 9. 104 pp. $8.00. Paul B. Hoeber, Inc., New York, 1930.

This is a very interesting volume in that it deals particularly with the soft tissues of the neck, a subject which has been practically overlooked in the regular texts. There has been a careful study of the normal soft tissue shadows of the neck in various age periods as well as a comparative study between the sexes.

The book is profusely illustrated, showing the conditions which can be diagnosed by the rather simple but careful technic used by the author. Among such are retropharyngeal abscess, various malignant and benign growths of the larynx and pharynx, ulcerations, diverticula and foreign bodies. Such a careful study of even a small portion of the body cannot help but aid in diagnosis and this book should be read by every radiologist. H. B. THOMPSON.

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THE BLOOD PICTURE AND ITS CLINICAL SIGNIFICANCE. (Including Tropical Diseases.) A Guidebook on the Microscopy of Blood. By Professor Dr. Victor Schilling, Physician-in-Chief, The First Medical University, Charité, Berlin. Translated and Edited by R. B. H. Gradwohl, M.D. Director of the Pasteur Institute of St. Louis, etc. Seventh and Eighth Revised Edition. With 44 Illustrations and 4 Color Plates, 408 pp. $10.00. The C. V. Mosby Company, St. Louis, Mo. 1929.

This is an excellent and exhaustive treatise on the microscopic examination of the blood. The first part deals with technic and contains very valuable descriptions of the steps in all the examinations that are of practical value. In the second part the author takes up the theory of the blood picture and carefully describes the morphology of the various cellular elements as found in normal and pathologic conditions. Much attention is given to the differential leucocyte count and the diagnostic and prognostic significance of the nuclear changes in the neutrophiles with descriptions of the "regenerative shift" and "degenerative shift." The different types of leucocytes and their significance are explained. The "hemogram" is an outline of the blood picture, giving the relative number of the various types of cells so arranged that any "shift" from the normal is readily apparent. Numerous hemograms appear throughout the book illustrating the blood picture under discussion. The different anemias and leukemias are described and the differential diagnoses given. One section deals with the blood picture of the infant and child as compared with that of the adult.

The third part gives fundamental principles for the clinical use of the blood picture, discussing blood pictures of special diagnostic importance and the clinical, symptomatic, and prognostic interpretation of the hemogram. The last part gives a large series of selected cases, illustrating the practical use of the blood picture and the hemogram. The book is a valuable addition to the physician's library. MAGNUSSON.

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RESEARCH AND MEDICAL PROGRESS AND OTHER ADDRESSES. By J. Shelton Horsley, M.D., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. 208 pp. $2.00. The C. V. Mosby Company, St. Louis, 1929.

Anyone familiar with the author's contributions to the field of surgery will anticipate pleasure and satisfaction in reading these essays. They deal with various subjects in the realm of medicine and surgery and each offers fascinating reading. The topics are suggestive, as "The Ideals of the Surgeon," "Shall Surgeons Tell the Truth?" and "Politics and Medicine." Each is a brief contribution offering food for thought that is well worth the brief period required for reading.

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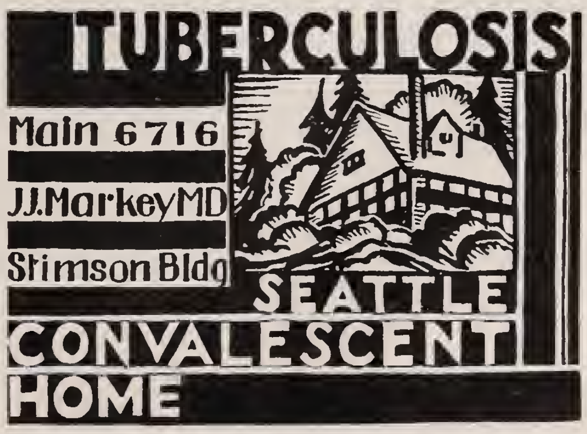

PATHOGENIC MICROORGANISMS. A Practical Manual for Students, Physicians and Health Officers. By William Hallock Park, M.D. Professor of Bacteriology and Hygiene, University and Belleveue Medical College, etc., New York City. Anna Wessels Williams, M.D., Assistant Director of the Bureau of Laboratories of the Department of Health, and Charles Krumweide, M.D., Assistant Director of the Bureau of Laboratories, etc. Ninth Edition, enlarged and thoroughly revised. With 21 Engravings and 9 Full-page Plates. 819 pp. $6.50. Lea & Febiger, Philadelphia, 1929.

This book needs no introduction to the general practitioner, since it has been one of the most reliable text-books in the market for some years. In this edition part one deals with general bacteriology and the study of bacterial moulds and yeasts. Part two considers the individual study of the pathogenic organisms, while part three discusses applied bacteriologic treatment and study of applied sanitation. The chapters dealing with the pathogenic cocci are particularly good, especially those discussing the pneumococcus and streptococcus. This book in its present edition is better adapted to bacteriologic and laboratory workers than to the general practitioner. NICKSON.

A TEXTBOOK OF PHYSIOLOGY FOR NURSES. By William Gay Christian, M.D., Professor of Anatomy, Medical College of Virginia and Charles C. Haskell, B.A., M.D., Professor of Physiology and Pharmacology, Medical College of Virginia. Second Edition, 153 pp. $2.00. The C.V. Mosby Company, St. Louis, 1929.

A knowledge of physiology is essential for all who deal with human ailments, including nurses as well as physicians. This volume presents the essentials of this subject in pleasing form, stated concisely. Chapters devoted to circulation, respiration, functions of different organs, as well as the special senses offer an opportunity to familiarize one's self with the fundamental principles existing in physiology. If a nurse absorbs the information contained in this small volume she will possess a working knowledge of this subject.

HANDBOOK OF BACTERIOLOGY FOR NURSES. By Harry W. Carey, A.B., M.D., Former Assistant Bacteriologist, Bender Hygienic Laboratory, New York, etc. Third Revised and Enlarged Edition. Illustrated with Forty-three Engravings and One Colored Plate. 282 pp. $2.25. F. A. Davis Company, Philadelphia, 1930.

The author states that this enlarged volume is intended not only as a text but for reference as well. Bacteria are classified according to their morphology and biology. The principles of infection, immunity and allergy are explained concisely and with clearness. Pathogenic bacteria are described individually as to their morphology, distribution, infection and treatment. Essential facts are presented. This volume should be of value to all nurses seeking information on this subject.

THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 9, Number 6. (Lahey Clinic Number—December, 1929.) 188 pages with 51 illustrations, and complete Index to Volume 9. Per Clinic year (February, 1929, to December, 1929.) Paper, $12.00; Cloth, $16.00. Philadelphia and London: W. B. Saunders Company.

This number contains reports on anesthesia, gastroenterology, medicine, orthopedics, urology, ear, nose and throat. Eight contributors discuss various phases of thyroid diseases. Lahey calls attention to the distinction between activating and apathetic thyroidism. The activating form is familiar to everyone on account of its obvious symptoms. The apathetic patient, on the other hand, does not exhibit the flushed, anxious and agitated condition of the former. There may be little tremor and a relatively low metabolic reading. It is frequently associated with cardiac decompensation, producing the picture termed "thyrocardiac." Sise gives his impression of the anesthetics, sodium amytal and avertin. The former is quite well known to the profession. The latter, tribromethylalcohol, a German preparation, is administrated by rectum. The patient may be sound asleep within two minutes, more commonly, however, taking five to ten minutes. There is a fall in blood pressure and the pulse slowed. Respiration is depressed and there is muscular relaxation. Anesthesia is prolonged but less so than with amytal. The writer thinks that either of these is suitable for light anesthesia or preliminary narcosis but they are unsuitable for deep anesthesia. Many other interesting subjects are discussed.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 13, No. 3. (New York Number, November, 1929.) Octavo of 272 pages with 58 illustrations. Per Clinic year, July, 1929, to May, 1930. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

Many interesting medical subjects are reviewed in this volume. Harris considers social aspects of otosclerosis, calling special attention to its familial characteristics. He quotes a family of four generations, all of whom had impaired hearing, most being of a pronounced character. There is disagreement as to the pathology of this condition but all are agreed as to its being incurable, although it has been intensively studied from various angles. Bullowa discusses the serum treatment of the pneumococcus pneumonia. He lists fourteen types of the disease, citing cases of several forms successfully treated by suitable serums. Caro and Riordan describe cases of varicose ulcers and eczema of the extremities cured by the injection treatment of the varicose veins. Many other instructive clinics are reported.

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## MANAGEMENT OF OCULAR EMERGENCIES*

James M. Patton, M.D.
OMAHA, NEB.

The general discussion of ocular disease may offer little that is of interest to the man in general practice but occasionally emergencies arise in connection with the eye which must be met, and as the vision of the patient often hangs on whether the emergency is properly met, the consideration of this subject is not out of place. Blindness is a terrible affliction and the responsibility for its prevention often lies with the family physician.

### INJURIES

The large proportion of ocular emergencies arise from injuries of various types. Corneal abrasions, wounds from impacted foreign bodies and superficial burns usually heal promptly with little or no resulting opacity, but occasionally an apparently innocent wound becomes infected or is infected at the time of injury and the cornea is damaged or lost from what seemed like a very insignificant lesion. All corneal wounds should be considered serious until they prove themselves otherwise by healing and only then can the physician relax his vigilance. The prompt removal of any foreign substance, frequent irrigations with boric or normal salt solution, hot fomentations to promote cell repair and a light dressing should be used in all cases where the epithelium is broken. The lacrimal drainage system should be carefully inspected. If there is a history of chronic watering, the tear sac should be explored and if infected should be destroyed or removed at once. If this is impractical, measures should be taken to render it as free from danger as possible. The patient should be impressed with possible seriousness of the condition and his cooperation secured. Any suggestion of infiltration at the base or margins of the wound should be taken as a danger signal and the patient referred to some one familiar with the management of corneal infections.

Chemical burns of the cornea are relatively frequent, due to the wide spread commercial and domestic use of these agents. Many of the common acids used in manufacturing operations, battery fluids, refrigerating solutions, especially ammonia, lime, concentrated lye, cleansing powders, and antiseptics are immediately destructive to corneal tissues. The laity should be frequently reminded of this fact and "danger" notices should be attached to all containers of caustic chemicals. The cauterizing action of these agents, whether phenol, alkaline or acid, is minimized or even neutralized entirely by profuse irrigation with water. But the irrigation must reach the chemical. Merely splashing water on the closed lids is of little or no value. If the irrigation is done properly, the danger may be over by the time the physician reaches the patient.

A guarded prognosis should be given even in apparently mild chemical burns, as there is no way of determining the extent of tissue injury at the first examination.

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* Read before the Thirty-Seventh Annual Meeting of Idaho State Medical Association, Lewiston, Ida., July 5-6, 1929.

* From the Department of Ophthalmology, University of Nebraska Medical College.

Blood in the anterior chamber, hyphemia, whether spontaneous or the result of external violence, is always alarming to the patient and should be given prompt attention. Usually if traumatic in origin and if there is no penetration of the globe or secondary increase of tension, a double bandage with the patient quiet in bed will usually clear up the vision in a few days. If the hemorrhage is the result of a blow, the possibility of retinal rupture or detachment must be considered and the quiet and double bandage continued until the physician can satisfy himself that the retina is intact, and even then the patient should be cautioned against stooping or straining for a week or so longer.

Penetrating wounds of the eye, whether with or without an intraocular foreign body, are grave emergencies and should be given most careful attention. If the penetrating agent is probably within the eye, prompt measures should be taken to localize it with the aid of the roentgen ray, if this is available, and if the foreign body is magnetic in character, an attempt should be made to remove it as soon as possible. If it is nonmagnetic, that is, glass, copper, tin, etc., it is sometimes better to leave it alone than to attempt its removal. Heavy objects such as B.B. shot or small chunks of lead usually cause so much irritation that the eye must be removed anyhow but even this need not be done at the first examination. Unless the foreign body has so completely destroyed the eye that there is no possible chance of giving any sight, the patient usually appreciates any effort on the part of the physician to preserve what sight there is left or even to avoid removing the globe. It is usually best not to advise radical measures until we are sure that everything has been done within the realm of safety to keep the eye.

If we are quite sure that the object causing penetration is not within the eye but has been caused by a knife, wire, etc., if the patient can be sent to some one who is specializing in the diseases of the eye, it is perhaps the most conservative thing to do. Wash out the conjunctival culdesac with a mild antiseptic such as 10 per cent argyrol or 1 per cent mercurochrome, apply a double protecting bandage to put the injured eye at rest, and warn the patient against strain of any sort and refer as promptly as possible.

If, on the other hand, it is not practical to send the patient to an oculist, it does not relieve the general practitioner of the responsibility of doing what he can to save the eye. If the patient is an adult, the eye can be anesthetized, first, by dropping in a few drops of three per cent cocain which will usually enable the patient to allow a thorough investigation of the wound. Nervous patients and children should be given a general anesthetic. If it is a clean perforation of the cornea or sclera without any prolapse of intraocular structures, cauterization of the wound with trichloracetic acid, a double bandage, rest in bed and general treatment mentioned later is probably all that will be necessary. If there is vitreous or uveal prolapse, anesthetization should be more complete, accomplished by carefully touching the operative field several times with a small cotton applicator moistened with ten per cent cocain.

When the area is quite insensitive, a sliding conjunctival flap should be prepared, with the sutures in place. The prolapse and adjacent tissue should be cauterized with trichloracetic acid applied carefully on a small finely drawn out cotton applicator, the prolapse grasped with fine forceps, drawn out slightly, and excised as close to the cornea or sclera as possible. The wound is again cauterized with trichloracetic acid and covered with the previously prepared conjunctival flap. Mercurochrome (1 per cent) or argyrol (10 per cent) is then instilled in the culdesac, a double bandage applied, and the patient put to bed. If from the history or appearance of the wound there is a possibility of an intraocular foreign body, a localizing roentgenogram should be taken.

If you have access to a roentgenogram operator who is accurately familiar with one of the geometric methods of localization, an exposure should be made at once. If, on the other hand, the geometric method is not available or if there is any question of the patient being able to cooperate, contact localizers should be applied to the conjunctiva as close to the upper and lower corneal limbus as possible. Small open rings of No. 26 suture wire may be clamped onto the conjunctiva or, what is probably better, a small loop of the wire or a thin sliver of sheet lead may be clamped onto a silk suture, the needle passed through a fold of the conjunctiva as close to the cornea as possible, and the opaque substance drawn tight against the conjunctiva and the suture tied. An anteroposterior and transverse exposure should then be taken, the localizers showing the exact position of the upper and lower corneal margins and the position of a foreign body easily and accurately determined from these two known points.

If a magnetic foreign body is located within the globe, the patient should be referred to an oculist who is familiar with the technic of removing foreign bodies with the electromagnet.

If we could be sure that the agent causing the wound was sterile, we would be relieved of much anxiety but this very rarely is the case, so the eye must be treated as though it was infected. With this in mind, the patient should be given rather large doses of sodium salicylate (from ninety to one hundred and twenty grains to the average adult per day), mercury by inunction and foreign protein intramuscularly.

### SYMPATHETIC OPHTHALMIA

If the patient is free from pain, it is perhaps just as well not to disturb the eye until after the second day, although a careful removal of the dressing and the administration of a drop or two of a mild antiseptic would probably do no harm after the first twenty-four hours. If there is no infection, the wound will heal up promptly and in a very few days the patient will be practically free from danger. On the other hand, if the eye stays red and is tender or if there is evidence of intraocular infection on ophthalmoscopic examination, then the question of a possible sympathetic opthalmia must be considered. Even if the eye is quite free from congestion, the remote possibility of sympathetic ophthalmia should be explained to the patient who must assume the responsibility for keeping the globe. Most patients have rather inexact memories so it is better to write out your opinion and give it to the patient in order that he can refer to it from time to time both for his good and your protection. In every case the patient should keep in close touch with his family physician and report at once, if the eye is at all congested or tender or if there there is any reduction of vision. This is a most treacherous condition and considerable damage may be done to the good eye before the patient is aroused to the fact that there is much the matter.

### PROTECTING GLASSES

This brings up the question of protection. In every case where an individual has but one eye or where through his occupation he is exposed to flying objects as are carpenters, machinists, stone workers, etc., he should be strongly urged to wear protecting glasses. In our experience fully ninety per cent of the injuries which affect the eyes would have been prevented, if the patient had been wearing suitably fitted protecting spectacles at the time.

The objection is raised that the glass of the spectacle may be broken and thus injure the eye. This is a very rare accident and for every eye that is injured by broken spectacles, there are literally thousands saved from injury by their use, and usually the force which is sufficient to break the glass would destroy the eye completely, if it were not for the protection afforded by the lense. However, the danger from broken spectacle glass can be entirely eliminated and the protective value of the lens greatly increased by the use of the so-called "laminated" or "nonsplintering" glass. This consists of two sheets of optical glass held together by a transparent binder which holds the fragments together in case the lens should be cracked by a flying object.

### PURULENT OPHTHALMIA

Turning now to these emergencies which are not due to external violence, perhaps a gonorrheal infection of the eye either in the new-born or the adult causes as much anxiety as any of the conditions that we meet with. As a rule the laity are fairly well informed as to the danger associated with this condition and report promptly if they suspect an infection. Nevertheless, occasionally we see advanced cases at the first examination.

It is not so very long since an infection of this character, especially in an adult, was looked upon with the gravest concern. Partial or complete destruction of the cornea was not an unusual thing, even when treated by those with the most experience. Within the last few years this danger has been greatly minimized through the use of intramuscular administration of foreign protein. Of course, with this treatment the local care of the eye must not be disregarded. Frequent irrigations sufficient to keep the eye free from discharge, a local antiseptic such as one per cent mercurochrome which is perhaps the best, or ten per cent argyrol, instilled every three or four hours and the application of a neutral ointment to the edge of the lids to prevent adhesions from the sticky pus, should be used in every case.

If but one eye is involved, the well eye should be protected with a suitable shield, preferably one of transparent celluloid (used roentgen-ray film from which the emulsion has been removed by dipping in hot water does very well, and is always available), made into a flat cone as described by the author (*Journal A. M. A.*, Sept. 24, 1927, Vol. 89, p. 1058), cut to fit the patient's face and fastened in place with collodion or adhesive tape. This allows the patient to get about and permits frequent examinations for evidence of infection. These measures are important, but we are convinced that the careful use of foreign protein is the most potent agent we have found in the treatment of this condition. It is our custom to use boiled milk, ranging from 1½ to 3 c.c. in the newborn to 5, 10, or 15 c.c. in the adult, according to weight and resistance.

Other foreign proteins may be equally good, such as diphtheritic antitoxin or antityphoid vaccine but milk is always available and gives excellent results. It is our custom to take rather new whole milk, boil it for five minutes in a double boiler, allow it to cool to body temperature and then inject it rather deeply into the gluteal muscles. In some instances a very marked improvement in the condition of the eyes can be noted in twelve hours after the administration of the protein. It is our experience, however, that the treatment must be continued for several days, even though the symptoms have apparently subsided. The application is usually repeated in eighteen to thirty-six hours, based on the local improvement noticed.

## KERATITIS

There is an ocular complication which occurs in patients who are suffering from prostrating general conditions which should be kept in mind. I refer to the corneal exposure which may occur when the patient is comatose or in a supposedly moribund state. The general condition is so grave that all thought of the eye is forgotten. The cornea becomes dry from exposure and may even break down and perforate without the patient or the physician knowing it. These cases usually die but occasionally one recovers only to find himself partly or totally blind through the failure of the physician or nurse in charge to protect the cornea. In every case where the patient fails to keep the lids closed when the eyes are at rest, whether this inability is due to extreme prostration or paralysis, the lids should be fastened shut with adhesive strips or, if the trouble is due to a paralysis, the margins of the lids should be held together with sutures or by a blepharoplastic operation.

Extensive corneal ulcerations are always alarming and usually the patient is willing enough to consult his physician, but occasionally considerable damage is done to the vision by recurrent rather small ulcerations which are due to some toxic condition in the system. Most frequently nasal pathology is the cause but occasionally the trouble can be traced to septic teeth, diseased tonsils or even more remote focal infections. Of the rapidly destructive ulcers the type due to the pneumococcus, with its advancing overhanging infiltrated margin and exudate in the anterior chamber, is the most easily recognized. In some cases this ulcer seems to progress in spite of all treatment, but a number of very helpful special methods of treatment have been devised such as the use of ethylhydrocuprion, the thermophore of Shahan, etc.

Thorough cauterization with full strength trichloracetic acid or even with the electrocautery is often of value and, as suggested by Dr. Harold Gifford, an incision into the anterior chamber through the entire thickness of the cornea, ahead of the advancing margin of the ulcer, very often stops its progress. This cut should be reopened two or three times each twenty-four hours in order to promote free leakage from the anterior chamber and, if the cut does not provide sufficient drainage, it may be necessary to burn a hole through the floor of the ulcer into the anterior chamber with the electrocautery. Other forms of local and general treatment must not be neglected, such as atropine, frequent irrigations, the use of local antiseptics as mercurochrome (1 per cent), subconjunctival injections of mercuric cyanide, the administration of sodium salicylate, if the iris is seriously involved, and the intramuscular administration of a foreign protein. Locally, hot fomentations for a half hour three to five times a day are of great benefit and should always be used.

## ACUTE GLAUCOMA

While we usually think of glaucoma as a chronic disease, the management of a fulminating acute case may well be considered under the head of an emergency. The intense neuralgic pain, often associated with extreme prostration, nausea and vomiting, the sudden loss of vision, the hard eyeball and hazy cornea are sufficient to arouse the greatest apprehension on the part of both patient and physician. In some cases the prostration is so severe that neither the patient nor the physician discovers that the eye is in any way involved. Not infrequently patients are treated for a day or more for the relief of the neuralgic headache and gastric disturbance before the local ocular symptoms are discovered. Every case of prostrating neuralgic headache should always suggest the possibility of acute glaucoma.

Prompt measures are essential, if relief of pain and restoration of vision are to be hoped for. If the tension does not react promptly to the use of a myotic (preferably eserine sulphate, one grain to the ounce), an emergency decompression should be attempted. As it is exceedingly difficult to secure satisfactory local anesthesia in an eye so deeply congested, it is usually better to give the patient a light general anesthetic and then insert a narrow cataract knife subconjunctivally into the anterior chamber between the iris and cornea, making an incision sufficiently long (two or three millimeters at least) to insure drainage into the subconjunctival space. If the anterior chamber is exceedingly shallow as the result of the glaucoma, then it is perhaps better to do a posterior sclerotomy, either subconjunctivally by sliding the point of the knife for a considerable distance under the loose conjunctiva before penetrating the sclera or else by laying back a conjunctival flap and making the scleral incision afterwards. Both of these procedures are emergency measures and, unless the physician has had considerable experience, the patient should be referred to someone who is especially skilled in the management of these most difficult cases.

Occasionally when a patient presents himself to the physician with a badly inflamed painful eye, it is difficult to determine whether the condition is an acute glaucoma or an acute iritis. Usually the contracted pupil, deep anterior chamber, muddy iris and history of pain after midnight should identify the latter, but in view of the fact that the treatment of the one is sure to aggravate the other, it is well to make as positive a diagnosis as possible before proceeding.

### CATARACTS AND SIMPLE GLAUCOMA

Although simple glaucoma, due to its gradual onset and progress, is not ordinarily an emergency, when it is associated with incipient cataract it may require very prompt action, if vision is to be preserved. Many a patient with beginning cataract has gone home with the instruction to wait until the vision is greatly reduced before returning for operation only to find, when he consults the oculist, that the eye is hopelessly damaged by simple glaucoma.

Simple glaucoma should be suspected in all cataract cases, where the vision is less than can be accounted for by the lens opacities, and when possible, all cases of incipient senile cataract should be checked up at least every three months with this condition in mind. Young children with traumatic cataracts will sometimes develop hypertension which due to the difficulty of examination, and lack of subjective symptoms may be unsuspected until serious permanent damage to vision has occurred.

### CONCLUSION

1. Simple corneal abrasions are potentially serious and if neglected may result in the loss of the eye.

2. A penetrating wound must be treated as though infected until proved otherwise.

3. Properly fitted spectacles will protect the eyes from at least 90 per cent of all forms of ocular injury and should be worn by all persons with but one useful eye.

4. Sympathetic ophthalmia is most insidious and may cause serious damage before recognized either by physician or patient.

5. Corneal ulcers, acute iritis and glaucoma may be emergencies that must be promptly and effectively met, if vision is to be retained.

6. Do not let cataract cases go blind from simple or secondary glaucoma. Be suspicious.

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## CARE OF ACUTE OTITIS MEDIA*

Ira E. Gaston, A.B., M.D.
PORTLAND, ORE.

In view of the great frequency of an acute infection of the middle ear and because it so frequently leads to very distressing complications, we should give serious thought to the problems of prevention.

First, let me recall to your minds very briefly the principal causative factors. Acute otitis media may result from any inflammatory condition of the upper air passages. At the head of the list I would place the common cold because of its marked prevalence. Infection of the middle ear is also a common sequela of the exanthemata, especially measles and scarlet fever. It occurs very often in some epidemics of influenza. Whooping cough and diphtheria are less frequent causes. Middle ear disease frequently results from infection of the nasal accessory sinuses, from swimming and diving, and from injudicious blowing of the nose, particularly during an acute infection. Improper nasal douching and nasal operations may result in infection of the tympanum.

The chief predisposing causes are the presence of adenoids, obstruction of the nasal passages, and what seems to be an hereditary disposition toward catarrhal and suppurative affections of the upper respiratory tract. Apparently the patency of the eustachian tube and the condition of the ciliated epithelium lining the tube have considerable influence upon the development of infections in the middle ear. Naturally a short wide-open tube with inactive cilia would favor the passage of infected material into the tympanum.

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In all conditions, where there is an acute inflammation of the upper respiratory tract, the maintenance of adequate ventilation in the nasopharynx will help very materially in preventing extension of the infection to the middle ear. The nasal astringents, of which ephedrine is the best, are most effective in securing this result. If an acute infection is present in the nasopharynx, the nasal antiseptics, as metaphen or argyrol, should be used also. Forcible blowing of the nose should be prevented during acute upper respiratory infections. This is particularly important during the congestive stage of measles. Swimming should not be indulged in during acute nose and throat infections and proper care should be practised at all times to prevent the forcing of water into the eustachian tubes while swimming or diving. The removal of infected adenoids and tonsils and nasal obstructions, and the elimination of paranasal sinus infections will go a long way toward lessening the occurrence of infections in the ear drums.

Of great importance in the care of acute otitis media is early diagnosis. The disease is most prevalent in children because at this age conditions which favor infection of the middle ear are most likely to occur, and it is at this age that early diagnosis is most difficult. Particularly in infants even the most severe types of infection of the tympanum commonly produce no symptoms whatever pointing to the ear. For that reason no examination of an acutely ill infant or young child is complete without a careful inspection of the ear drums. In the case of patients who are old enough to localize their pains we are apt to get a history of definite distress in the ear. But even in these cases certain types of infection, notably the streptococcus mucosus, may advance insidiously with little or no pain in the ear and escape detection until serious complications have arisen.

In most cases of acute otitis media inspection of the ear drum will reveal unmistakeable signs, such as congestion and bulging of the tympanic membrane which leads very early to obilteration of the handle and short process of the malleus. In very fulminating inflammations one may find bullae filled with a serosanguineous fluid on the surface of the tympanic membrane or on the walls of the proximal portion of the external auditory canal. On the other hand, infections of low virulence may produce such slight changes in the ear drum as to be difficult to distinguish from the normal. There may be only a moderate thickening of the tympanic membrane with a loss of its normal lustre and a moderate injection about the handle of the malleus. Often there is also to be seen dilated blood vessels on the surface of the membrane extending from the periphery to the umbo. A moderate bulging of the membrane may be seen, due to collection of fluid in the tympanum. This is a typical picture of the so-called adenoid catarrh of children, or the acute catarrhal otitis media of adults, and from the otoscopic picture alone it is often impossible to determine whether we are dealing with an infective process in the early stages, or with a catarrhal process.

In most cases, however, there are other symptoms present which will help in deciding the issue. In an infected process there is usually an appreciable rise of temperature and usually symptoms of an acute infection in the nasopharynx. Besides, the pain in an infective process is generally more acute than in a catarrhal condition. An external otitis may produce congestion of the tympanic membrane and often considerable pain, but this condition is distinguished from acute otitis media by the absence of fever and bulging of the drum head. On the other hand, we not infrequently encounter cases with a fulminating inflammation, in which the changes in the tympanum are very slight. The condition is not uncommonly found in infants where there is a virulent infection of the mastoid antrum, with only a moderate dullness of the tympanic membrane and more or less congestion and sagging of the posterior superior wall of the external meatus.

In other cases the only objective sign may be acute congestion and bulging of Schrapnell's membrane. The otoscopic picture produced by a streptococcus mucosus infection is usually that of a markedly thickened dull membrane with little or no congestion and only slight bulging. In fact, there is usually very little fluid in the tympanum in these cases. The typical case of acute otitis media with marked pain in the ear and marked congestion and bulging of the tympanic membrane can hardly be overlooked, but we must be constantly on our guard lest we miss the atypical case, which may result in serious consequences for the patient.

As before stated, it may not be possible to determine with certainty at the first examination whether or not the patient is developing an infective process in the ear drum. In these cases frequently repeated examinations should be made to determine whether or not the condition is progressing. Very mild types of infection of the ear drum may resolve and clear up without drainage through the tympanic membrane. As soon as the diagnosis of a progressive infection is reasonably established, however, an adequate paracentesis should be done. It is true that a considerable number of cases will rupture spontaneously, either with or without the use of ear drops, and clear up without any serious complications. But it is also true that the great majority of patients who come to operation for mastoiditis are those in which drainage through the ear drum has not been established early. We must not forget, however, that some cases will develop a surgical mastoiditis even with the earliest possible drainage through the tympanic membrane, due to the virulence of the infection and to the conformation of the cavities.

In doing the paracentesis a mere puncture of the tympanic membrane is usually not sufficient. A wide incision should be made, generally through the posterior inferior quadrant. If there is no evidence of fluid in the posterior portion of the tympanum and there is considerable bulging and congestion of Schrapnell's membrane, the incision should be made through the superior quadrant. It not frequently occurs in infants that there is little or no bulging of the tympanic membrane but considerable congestion and sagging of the posterior superior wall of the external canal. In these cases the incision should be carried through the posterior quadrant of the membrane into the proximal portion of the posterosuperior wall. This incision sometimes serves to drain the infected mastoid antrum, and may obviate an external antrotomy.

Paracentesis may be performed with no anesthetic with the use of local anesthetic, preferably cocaine, menthol and phenol in equal parts; or under a general anesthetic, preferably nitrous oxid, ethylene or ethyl chloride. In infants it is probably best to use no anesthetic. In older children and adults the temperament of the patient must be considered, as the local anesthetic does not make the operation painless when the tympanic membrane is congested.

After the paracentesis free drainage should be encouraged by frequent cleansing of the external auditory canal. The dry treatment, with a wick drain in the external canal, may be used if a skilled nurse is in attendance; if not, frequent syringing of the canal with warm boric acid or saline solution is best. The use of hydrogen peroxide drops before irrigation usually helps to clear out the thick discharge. The treatment should be repeated every two or three hours in severe cases, drying the canal as well as possible after each irrigation, and placing a pledget of sterile absorbent cotton, rolled to the shape of a cone, into the external portion of the canal.

The skin about the canal should be kept clean to avoid irritation from the discharge. The use of antiseptics in the external canal, such as anilin dyes, mercurochrome, argyrol, etc. are of questionable value in clearing up the infection in the middle ear. It is important to avoid chilling of the affected ear, as this tends to increase the congestion in the tympanum and mastoid antrum and thus retards the drainage. In children it is well to use a light hood with a pad of cotton over the discharging ear at night. If there is considerable fever and prostration, confinement to bed is advisable, and general supportive measures should be employed in all cases.

Attention to acute infections of the nose and throat will usually have a favorable influence upon the progress of the infection in the ear. Some authorities, notably Turner of Edinburgh, advocate the removal of adenoids in children at the same time the paracentesis is performed. Undoubtedly it is desirable to secure good ventilation of the eustachian tubes, but it is questionable if one is justified in performing an adenoid operation in the presence of an acute infection in the nasopharynx. In cases where the infection in the ear continues after the acute condition of the nose and throat has subsided, and particularly when the aural discharge tends to become chronic, with no symptoms of surgical mastoiditis, the adenoids should be removed, and in most cases also the tonsils. Intranasal pathology, such as sinus infections and nasal obstructions, if present, should be given attention in these cases. Some authorities advocate the use of autogenous vaccines in cases which are subacute and tend to become chronic.

Perhaps the most important and the most difficut question to decide is the indications for opening the mastoid. Unquestionably a considerable number of mastoid operations are performed unnecessarily. It is not uncommon to see patients who have had pain in the ear for two or three days or less, with marked tenderness over the mastoid antrum, and sometimes over the tip of the mastoid as well, and at times with considerable periosteal thickening over the mastoid process. This early tenderness is what Alexander of Vienna has termed "mastoidism." The temperature may range from 100° or 101° in the adult to 103° or 104° in the young child. There may be considerable prostration, and in the young very often symptoms of meningeal irritation due to the extension of the inflammation through the ununited sutures in the roof of the attic. These are not indications for a mastoid operation but for an adequate paracentesis. The great majority of these cases will clear up, if free drainage is established through the ear drum.

It is probable that every case of severe infection of the tympanum is accompanied by infection of the mastoid antrum, and probably also by an extension of the inflammatory process into the mastoid cells. If the external cortex is thin, there is likely to be early tenderness of the periosteum over the mastoid bone. Often there is very little discharge during the first twelve to twenty-four hours after paracentesis, and little improvement in the patient's condition. Usually by the second day, however, a free flow of seropurulent material has begun; the pain in the ear is considerably less; the temperature is lower; and there is a noticeable improvement in the general condition of the patient.

In cases with severe symptoms, if improvement is not manifest within three or four days after paracentesis, operation of the mastoid should be seriously considered. Particularly in the case of infants with severe toxic symptoms from an acute aural infection, external drainage of the mastoid antrum should not be delayed, if there is not prompt improvement in the patient's condition after adequate paracentesis.

According to Politzer, the size of the tympanic antrum in the new-born infant is actually greater than in the adult; hence, there is a considerable surface for absorption of toxic products from this cavity. You are no doubt familiar with the reports of Dean, Marriot, Lierle, and many others, working in the field of pediatrics, in which they have shown that an acute infection of the mastoid antrum in infants very often produces severe toxic symptoms, amounting in some cases to the cholera morbus syndrome. They have found that most of these cases can be saved by prompt drainage of the infected mastoid.

In cases with no severe toxic symptoms and no evidence of extension to the intracranial structures or sigmoid sinus or involvement of the facial nerve, expectant treatment should be followed, maintaining free drainage through the external auditory canal. This type of treatment can be continued five or six weeks, if there are signs of gradual improvement. It is usually unwise to allow a discharging ear to continue longer than six weeks on account of the danger of impairment of the hearing.

In these cases with free drainage from the antrum and mastoid cells through the tympanum there is little danger of an extension of the infective process to the meninges or sinus within the first two or three weeks. However, if the infection has been present a week or ten days before drainage is established, there is much more likelihood of an extension beyond the mastoid cells. A factor of great importance in this connection is the type of organism present. The streptococcus mucosus capsulatus and pneumococcus are very prone to insidiously destroy the thin plates of bone separating the mastoid cells from the cranial cavity and sigmoid sinus. The streptococcus hemolyticus also often extends beyond the confines of the mastoid, but in so doing usually sets up severe toxic symptoms. The streptococcus pyogenes, which is the most common type of organism found in the middle ear and mastoid, is less apt to errode the bone.

It is an advantage to have a bacteriologic study of the case from smears and cultures taken at the time the paracentesis is done. In all severe cases both the white and red count and the hemoglobin estimation should be done. A white count of 20,000 or over with a high percentage of polymorphonuclears usually indicates something more than a simple mastoiditis. On the other hand, particularly with a hemolytic streptococcus infection, a low white count with a rapidly decreasing red count and hemoglobin percentage is usually an indication of rapid extension of the infective process. Radiographs of the mastoids, except in infants, are of considerable help in determining the extension of the infective process, and of more importance in determining the presence or absence of destructive processes in the bony walls of the cells.

Pain is usually an important symptom. Other signs being equal, if pain deep in the ear does not subside soon after paracentesis, or if it recurs later, mastoid operation should be advised earlier than when pain is absent. If the pain is referred upward from the ear toward the vortex or backward toward the occiput, it is likely to indicate a deep extension of the infective process. Tenderness and swelling over the mastoid process, if occurring late, is definite evidence of extension of the infection through the external cortex. Swelling superior and anterior to the auricle usually means the involvement of cells in the base of the zygoma. The absence of these signs, however, in the presence of positive symptoms of extensive infection in the mastoid, such as continued pain, fever, leucocytosis, purulent discharge and congestion and sagging of the tympanum and posterior superior wall of the external meatus, is usually of more serious importance, because it indicates an infection of the mastoid cells confined under a thick external cortex, and this condition favors a deep extension of the infective process.

In cases of acute purulent otitis media, in which there are no serious complications and in which one has no definite reason to suspect an early development of such complications, it is usually best to treat conservatively for at least ten or twelve days. In fact, patients usually do better postoperatively, if they can be given a little time after the onset in which to build up an immunity toward the infection. If after that length of time there should be no signs of improvement, such as a definite lowering of temperature and lessening of the congestion about the ear drum, one should advise mastoidectomy. At this period a profuse discharge is not in itself an indication for mastoid operation, if the other symptoms are subsiding.

At times all of the symptoms may subside temporarily in a condition that is really surgical. For example, in the case of a child who gave a history of vague discomfort in the ear over a period of two weeks before paracentesis was performed, the temperature returned to normal; the congestion about the ear drum subsided, and the discharge had almost stopped on the tenth day after drainage was established; but two days later all the symptoms returned with increased intensity and mastoidectomy revealed an extensive coalescent infective process. In another case an adult, who exhibited all the symptoms of extension of the infection through the wall of the sigmoid sinus seven days after the onset, and in whom radiographs indicated destruction of bone about the wall of the sinus, recovered without mastoid operation. Every case of acute purulent otitis media is a potential surgical mastoid, and should be watched carefully and a guarded prognosis given until it is well on the road to recovery.

726 Medical-Dental Building.

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# BRAIN ABSCESSES OF OTITIC ORIGIN *

Frank A. Plum, M.D.
HONOLULU, T. H.

Every physician in his practice sometimes encounters the patient with either the acute or chronic discharging ear. The problem of deciding upon the correct treatment to institute is sometimes most difficult. Occasionally serious situations arise with but little warning, the sequelae of which may be most grave.

For example, in the infant a primary jugular bulb thrombosis may arise over night, following an acute otitis media without mastoid complication. In the child an acute mastoid may suddenly develop or a lateral sinus thrombosis. In the young adult with a discharging ear we may be suddenly confronted with the horrid spectre of a deep seated intracranial abscess.

The abscesses of otitic origin for practical purposes may be limited to the extradural abscess, the subdural, abscess of the temperosphenoidal lobe and of the cerebellum. The last two are of the greatest importance as the extradural and subdural abscess may be but steps in their development.

Brain abscesses in most cases arise by direct extension but not always. They may be blood-borne. Eagleton has recently reported a case of a metastatic abscess following trauma in a man who two days before had been operated upon for hemorrhoids.

## ANATOMY

An important anatomic structure that must be considered is the tentorium cerebelli. It arises in part from the inner margin of the petrous portion of the temporal bone, encloses the lateral sinus and passing upward and inward forms a distinct boundary, dividing this space into supra- and infratentorial regions.

Directly over the roof of the mastoid antrum is the tegmen tympani, the weak point in the wall and the area where infection usually breaks through when it passes upward into the supratentorial space. It is by this route that our temperosphenoidal lobe abscess may be expected to develop.

On the inner side of the petrous portion of the temporal bone is the saccus endolymphaticus. An acute purulent labrynthitis may break through at the point and produce an abscess of the cerebellum. An abscess of the cerebellum may also arise secondarily to a lateral sinus thrombosis. In this case our pathology will be infratentorial.

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* Read before Territorial Medical Society of Hawaii, Honolulu, T. H., April 26, 1929.

### DIFFERENTIAL DIAGNOSIS

When we anticipate an intracranial lesion we must bear three things in mind: (1) tumor, (2) meningitis, (3) abscess.

*Tumor* can usually be ruled out by the history. It is usually slow in onset, progressive over a period of months. The headache is not so severe, eye symptoms come on slowly; no fever, patient not septic, no history of otitic pathology.

*Meningitis* at times presents more difficulty. The spinal puncture will show a high cell count. There is usually considerable fever and the mental condition will be active. There is an irritability but the mental alertness will continue until the final coma. Headache is severe and vomiting constant. We should try to rule out meningitis by testing rigidity of the neck, Kernig's sign, Brudzinski's sign, tache cerebrale, Babinski's sign and clonus.

*Brain abscess* is one of the most difficult problems of diagnosis that can be encountered, and one in which exact localization is of greatest importance. The symptoms are obscure and few in number in many cases. Without operative interference it is almost 100 per cent fatal, and yet needless surgery may cause great damage. Surgically the problem is almost that of tumor but with infection added.

### GENERAL SYMPTOMS

One of the earliest changes to be noted is the mental depression that has come over the patient; then a slow cerebration becomes manifest. Questions will be answered correctly but the answer is slow in coming. Then will come a failing memory, listlessness, loss of sustained attention. He will live like one in a dream.

This condition in a person with chronic otorrhea or following a mastoid forces the surgeon to consider abscess. A little later a whole train of symptoms may develop, as fever, headache, restlessness, nausea and vomiting, increase in deep reflexes and a slow pulse.

*The fever* is not apt to be higher than 99°-100° unless meningitis is also present. It may be subnormal for a part of the time. The fever is rarely higher than is found with otitis media or a mastoid.

*Headache* is due to three causes and is intense: (1) general toxemia of the infection, (2) increase in intracranial pressure, (3) localized meningeal irritation.

*Restlessness.* This is due to the headache. He becomes sleepy and stupid but the extreme headache prevents him from sleeping. He continuously tosses and moans in distress. Politzer says, "suspect abscess when a patient with a septic meningitis is dull and apathetic instead of being irritable."

*Increase in deep reflexes* is the rule. They are rarely diminished.

*Facial paralysis.* This may be considered to be due to direct extension of the otitis media to the seventh nerve in the fallopian canal. It is only due to cortical involvement in very large abscess and is then a late symptom.

*Slow pulse* indicates an increase of intracranial pressure. It may fall to fifty or sixty or under when lying down. With a temperature of 101° it may be seventy-two or above, a relative decrease in rate. (This is important to note.) A drop in the pulse rate of an operated case usually means faulty drainage. An occasional falling of the pulse to subnormal with a normal or elevated temperature is a most valuable sign.

*Eye symptoms* are varied. With posterior fossa lesions, the choking is of greater degree than anterior. One outstanding eye symptom noted by Eagleton and particularly associated with brain abscess is the rapid changing in the form fields and especially the hemianopic indentations of the discs, antedating violent outburst and changing from day to day.

*Cerebrospinal fluid.* Yerger has done some interesting work on fluid studies. He found the cell count to be increased in all intracranial inflammation. In extradural abscess and in sinus thrombosis the cell count ranges from 25 to 250. In subdural abscesses and brain abscesses the range is from 250 to 2500. Any count above that has proven to be meningitis. The pressure is but slightly increased.

*Nausea and vomiting* are due to increased intracranial pressure. It is greater in involvement of the basal meninges.

*Convulsions.* Eagleton states that in his experience a sudden onset of convulsions in the presence of a possible focus of infection has always proven to be a cerebellar abscess. This is particularly true in children.

### PATHOLOGY OF BRAIN ABSCESS

The symptoms come from pressure and from toxic absorption. The abscess begins as a small point and enlarges, not by displacement of brain tissue but by destruction and replacement of broken down tissue in its formation. It exerts pressure in all directions. There is always an accompanying encephalitis, which entails pressure from a surrounding edema. This shifts continually and produces the very frequent changes found in the visual form fields. The majority of the abscesses are encapsulated, the walls at times reaching a thickness of three-eighths of an inch, according to Phillips.

### AGE OF PATIENTS

Intracranial abscess occurs mostly between the ages of ten and thirty years. Tod collected one hundred cases in children under ten years of age. Of these he found temporosphenoidal lobe abscess in 87 per cent and cerebellar in 13 per cent. Among adults he found temporosphenoidal lobe in 65 per cent and cerebellar abscess in 35 per cent. Korner and others emphasize the significance of pain, more or less localized at the site of the abscess upon percussion of the head. They consider this a sign of great importance.

### TEMPOROSPHENOIDAL LOBE ABSCESS

Kennedy describes the temporal lobe as a vast unchartered region with only one known bilateral center, that of taste and smell placed in the uncinate lobules. One unilateral center of auditory memories lies in the transverse gyrus of Heschl.

He states, "Speech defects only occur in the temporosphenoidal lobe lesions, when destruction has taken place in the transverse gyrus of Heschl and the posterior three-fifths of the superior temporal convolution." This he states is contrary to textbook teaching. Also, "of all the speech defects due to massive left sided lesions, the outstanding feature is the depression of the power to recollect names, especially persons, places and things." No mistakes may be made in ordinary conversation but the patient is instantly at loss to name objects presented. This is due to a deterioration of the function in the association tracts within the visual and auditory centers.

*Location of Abscess.* The temporosphenoidal lobe abscess itself lies deep in the brain substance and tends to large size and is usually found in the white matter in the center of the lobe. Frequently the actual pathway of the infection may be found leading up from the tegmen tympani.

McEwen has pointed out that in case motor paralysis develops it will be from below, upward and on the opposite side; first the face, then the arm, then the leg. Before paralysis sets in there will be first fibrillations or mild spastic contraction, then weakness, then the paralysis. This progress of symptoms is diagnostic in itself of a temporosphenoidal lesion. Should the pressure be directed downward toward the base of the brain, the third, then the fourth and then the sixth nerve would be involved in the order named.

An abscess pressing directly inward would involve the internal capsule and cause sudden paralysis of the extremities of the opposite side. This might be mistaken for an apoplexy, if the otitic condition were not remembered. An encephalitis of the temporosphenoidal lobe could involve the fibres of the optic radiation and produce an homonymous hemianopsia.

### ABSCESS OF THE CEREBELLUM

These abscesses are, of course, infratentorial. They are usually small and superficial and occupy the brain substance in close approximation to the mastoid and petrous portion. Occasionally they may be deeply placed in the cerebellum, being large, even occupying a position posterior to the lateral sinus.

*Characteristic symptoms.* (1) Spontaneous nystagmus, (2) rombergism, (3) deviation of the pointing test, (4) dysdiadokokinesia (a disturbance of coordinated movement on the same side as the cerebellar lesion), (5) yawning and slow speech, (6) optic neuritis, (7) headache usually occipital but sometimes frontal, (8) disturbances of consciousness less common and less profound than in temporosphenoidal lobe lesions but may be observed.

*Spontaneous nystagmus.* In labyrinthine disease after the initial storm, the spontaneous nystagmus gradually subsides and disappears after a few days. In cerebellar abscess it continues as long as the lesion or the patient survives.

*Rombergism.* The patient tends to fall toward the side of the lesion.

*Deviation of the pointing test.* This is important in cerebellar lesions and may be used in conjunction with the Barany tests. The patient may past point with the finger on the side involved. He may have difficulty in locating the tip of his nose or in locating parts of one lower limb with the heel of the lower limb involved.

*In dysdiadokokinesia* the affected side shows a slow, awkward and imperfect pronation and supination. Flex the hip and knee, then suddenly extend. In cerebellar lesions the movement can only be performed slowly and gradually. These unilateral disturbances occur on the same side in cerebellar lesions.

*Purulent labyrinthitis* is frequently the precursor of cerebellar abscess. If the hearing as shown by bone conduction is not seriously impaired, we may rule out a general purulent labyrinthitis. Any patient who has been operated on for a lateral sinus thrombosis should be watched for a cerebellar abscess.

*Occipital headache* and some rigidity of the neck may be present in both cerebellar abscess and in incipient meningitis. Lumbar puncture should be done frequently and the fluid studied.

It should be remembered that occasionally in an acute meningitis the lumbar puncture may be clear and with few cells. This is usually due to a massive blocking of the subarachnoid space in the cisterna magna, blocking off the subarachnoid space of the cord from the brain space. In this case a cisternal puncture should certainly be done before meningitis is ruled out.

### OPERATIVE TREATMENT

The operative treatment is based entirely upon drainage of the source of infection and upon the abscess itself. It is first advisable to lower the intracranial pressure by spinal puncture, remove 30-40 c.c. Next is to do a radical mastoidectomy. There is a division of opinion regarding the drainage of the abscess cavity. Should it be done through a separate clean wound or through the mastoid wound. Both routes have advantages and disadvantages.

If done through the mastoid wound, dura in relation to the tegmen tympani, lateral sinus or posterior fossa, as the case may be, should be thoroughly laid bare. Note whether the dura is tense, bulging or pulsating; any discoloration, or any signs of granulation tissue. The dura should be incised anteroposteriorly so as to avoid dural vessels. A generous opening in the dura is advisable.

In the cerebellum the knife should be entered in a direction inward and slightly backward, to bring its point into the cerebellum just behind the saccus region. It is withdrawn slowly without any lateral motion. If the exploration is negative, the knife may be passed directly backward, then backwards and outward behind the lateral sinus. If still no pus is found, the occiput should be opened and the cerebellum again explored. In exploring for a temporosphenoidal lobe abscess the dura is opened and the knife passed vertically upward into the brain, but it should not go deeper than two inches because of danger of entering the ventricles.

McKenzie states, "Experience has shown that exploration of the brain through a mastoid wound either into the cerebellum or cerebral hemisphere, if ordinary precautions are used, does not lead to ill effects. Meningitis is not likely to follow, nor is brain abscess set up, if not already present." He also advises "a free and not a small dural incision."

Abscess may be subdural, cortical or subcortical. The subarachnoid space directly over abscess is not usually walled off.

In opening through a clean wound, various methods of procedure are again used. Grant advises opening over abscess with trephine, inserting a small piece of cotton soaked with mercurochrome and waiting for forty-eight hours and then tapping. King unroofs the abscess, produces adhesions, then does an actual decompression, removing the dura and cortex of brain distal to abscess. This results in a hernia of the abscess wall. The disadvantage is that a defect remains with a pulsating brain only covered by skin.

Cushing advises that the abscess be marsupialized by stitching its wall to the dura. This is a modification of King's method. In deep abscess it is best to tap. The brain is not accustomed to handling infection. Dandy prefers to simply tap the abscess a number of times if necessary. He thinks that this gives less cerebritis.

The heavier the capsule the better the prognosis. Postpone operation until signs of pressure develop. Avoid entering an acute abscess if possible. The actual incision of the dura and exploration of the brain is painless and may be undertaken without an anesthetic.

In closing may I leave these thoughts for your consideration.

1. Every neglected cause of chronic otitis media is a possible future brain abscess.

2. A dull stupid mental condition instead of an alertness in a meningitis case makes one seriously consider abscess.

3. The occurrence of hemianopic indentations and rapid form changes in daily visual fields is pathognomonic of brain abscess.

4. A fourth nerve paralysis localized the lesion to the posteria fossa.

5. A spontaneous nystagmus, lasting for days associated with cerebrooccipital meningitis and general signs of abscess, is diagnostic of an abscess of the cerebellum.

6. A vertical nystagmus at any time is absolutely proof of an intracranial lesion, either tumor or abscess.

7. An otitic infection with gradual onset of a paralysis on the opposite side, involving first the face, then the arm and then the leg, is almost positive proof of a temporosphenoidal lobe abscess.

8. If an optical aphasia (knows an object but unable to name it) develops in a right handed person with a left chronic otitis media, it is almost positive evidence of a left temporosphenoidal lobe abscess.

# CHRONIC DUODENAL STASIS

H. L. Bockus, M.D.
PHILADELPHIA, PA.

(Concluded)

## II. Duodenal Stasis Dependent Upon Organic Disease

Duodenal stasis not due to mesenteric occlusion is of peculiar interest because of its rarity and of the diagnostic difficulties which are encountered. Congenital bands or membranes and periduodenal adhesions, pancreatic disease, enlarged glands due to carcinoma, tuberculosis or syphilis, duodenal malignancy, diverticulosis, duodenal ulcer, upper gastrointestinal syphilis and pressure from a tumor or inflammatory mass are the more important etiological factors.

### PERIDUODENAL BANDS OR MEMBRANES

Duodenal stasis dependent upon constricting bands or membranes involving the terminal duodenum closely simulates the stasis of mesenteric pressure. Duval mentions three types. (1) The Mayo membrane unites the inferior surface of the transverse mesocolon to the right side of the first jejunal loop. Closure of the duodenojejunal angle may result. (2) The posterior parietal peritoneum may be connected by fibres to the third portion of the duodenum, causing dilatation and stasis proximal to their duodenal attachment. (3) A thickening of the ligament of Treitz over the superior duodenal fossa may constrict the duodenojejunal angle. Sloan reports the cure of a number of cases of duodenal ulcer merely by separating bands in this neighborhood.

Congenital bands or membranes are in my opinion a very rare cause of sufficient duodenal stasis to be of clinical importance. The differentiation between mesenteric occlusion and stasis due to a membrane attached to the terminal duodenum would be impossible in most instances. The Hayes' maneuver under the fluoroscope would probably have an identical result, namely emptying the duodenum. The obstruction is in almost the same situation in both types of stasis.

The following is the report of a case in which congenital adhesions or bands involving the terminal duodenum and transverse colon must be considered as a possible etiologic factor. Unfortunately confirmation by inspection of the viscera was not possible.

Case 1. W. H., white boy fourteen years of age, has always been unusually free from infectious diseases and colds. During the intrauterine life of the patient, his mother lost her first born as a result of a tonsil operation and remained ill throughout her pregnancy with this child. The labor was difficult and a cranial injury to the forehead and mastoid region resulted.

Straining, choking and belching started at birth. He was taken off the breast on this account but the symptoms persisted. The boy had typical epileptiform convulsions every three or four weeks, from nine months to seven years of age. They have been infrequent since that time but still occur. He complained of frequent spells of weakness and exhaustion relieved by belching. Explosive belching attacks occur very often. He can eat only very small quantities of food and eats between meals because of hunger. The boy lacks energy and has an increased capacity for sleep. He was taken out of public school, being unable to keep up with his studies. He is doing fifth grade work in a private school.

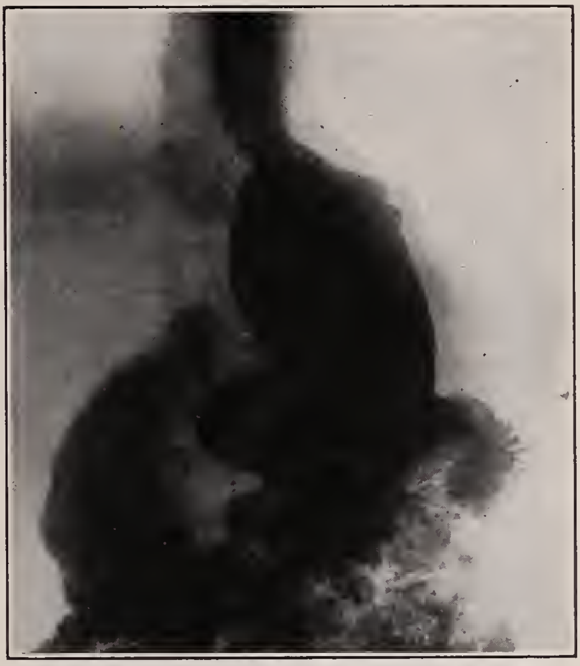

Fig. 7. Esophagus dilated. Small stomach. Enormous dilatation of duodenum.

The physical and genital development is that of a boy of eight years of age. He is left handed, has a prominent nose and closely set eyes. The incisor teeth are notched. They are erupted very irregularly. The palate is high. Tonsils are enormously hypertrophied. Heart and lungs and abdominal examination are essentially negative. A marked hypochlorhydria was found by gastric analysis. The stomach emptied in normal time. There was no bile regurgitation or occult blood. Urine and feces negative. Blood count normal except for lymphocytosis. Blood chemistry normal and serology negative.

Roentgen-ray examination by Dr. B. Widmann revealed a very small stomach, having a capacity of only four ounces. There was no sphincteric action at the cardia; the esophagus remained filled and seemed considerably dilated. The duodenum was enormously dilated down to the crossing of the spine. It was as large as the stomach. No retention in stomach or duodenum at six hours. The midportion of the transverse colon was fixed in a position corresponding to the duodenal obstruction (fig. 7).

Definite constitutional inferiority is suggested by physical examination and mentality. With this in mind the gastrointestinal anomalies seem in keeping. They are: (1) Dilated esophagus apparently due to gastric over flow, (2) abnormally small stomach, (3) extreme dilatation of duodenum to juncture of third and fourth portions, (4) fixation of the transverse colon corresponding with the point of duodenal obstruction. A congenital band or membrane or some congenital anomaly of the mesentery seems the most likely explanation. In view of the enormous dilatation of the duodenum, the absence of dilatation of the stomach is difficult of explanation.

The hepatoduodenal membrane of Harris is attached to the first or second part of the duodenum. If obstruction were produced, it would cause dilatation and stasis proximal to the second portion of the duodenum. Roentgen-ray examination should easily differentiate this type from mesenteric occlusion or stasis due to terminal duodenal pathology.

The following case of stasis in the stomach and cap might conceivably be due to a Harris membrane or a low duodenal ulcer.

Case 2. A. A., male nurse, twenty-nine years of age, has had symptoms for only five weeks. The chief complaint is epigastric pain, coming on from two to three hours after meals, relieved by eating. No nausea or vomiting. Physical examination negative. Gastric analysis revealed a grade 1 hyperacidity. There was twelve hour food retention. No bile or occult blood. Bile drainage normal. No anemia.

Roentgen-ray study showed enormous dilatation of cap and stomach, and gastric hyperperistalsis. Barium was retained in both the stomach and cap at six hours. There are several things of unusual interest. The history suggests duodenal ulcer. There is no filling defect resembling ulcer. Dilatation of cap is greatly against it. The second and third portions of the duodenum were not visualized. This rules out mesenteric occlusion. A lesion of some sort is probably present at the junction of the cap with the second portion of duodenum. Ulcer is most likely; a Harris membrane is possible. Symptomatic relief on a medical ulcer favors the former but does not rule out the possibility of the latter diagnosis.

## GROSS PATHOLOGIC PROCESS CAUSING PRESSURE ON THE DUODENUM

Cases of obstruction of the terminal duodenum due to pressure of a pathologic process in the neighborhood present interesting and often difficult problems in diagnosis.

Mesenteric glands may be of sufficient size and so situated as to produce obstruction of the terminal duodenum. Tuberculosis, malignancy, syphilis and the lymphoblastomata must be borne in mind.

The following is the summary of a case recently reported in detail in the *Medical Clinics of North America.*

Case 3. A. J., colored male twenty-nine years of age, was admitted to the Graduate Hospital, March 8, 1928. He denies venereal infection. Married three years and has two healthy children. The only past illness was an attack of pleurisy in 1918.

The present illness started in December, 1927, with pyrosis, belching and vomiting, attacks of aching pain and soreness in the midabdomen associated with vomiting occurring every two or three days. There is a questionable history of the passage of "tarry stools" on several occasions since the onset. No cough, dyspnea, or night sweats. For several weeks previous to admission emesis followed any attempt to eat, although no definite history of "retention" vomiting could be elicited. He had lost fifteen pounds since the onset of the illness.

He appeared emaciated, was dehydrated, and seemed at least forty years of age. Temperature, pulse and respirations were normal. The habitus was normal, the skin was dry. A generalized and extensive adenopathy involving the submaxillary, anterior and posterior cervical, inguinal and axillary nodes was noted. The glands averaged a size comparable to an almond and were quite hard. The pupils were slightly irregular and reacted sluggishly to light. The chest was of the phthisical type. Signs suggesting a partial fibrosis of the left apex and the whole of the upper right lobe were obtained. Gastric peristalsis was visible, and a succussion splash indicated a dilated stomach containing fluid.

Laboratory data. Red blood-cells, 3,710,000; white blood-cells, 10,250; hemoglobin, 63 per cent; lymphocytes, 47 per cent. Urine essentially negative. The Wassermann and Kahn reactions were strongly positive. The blood chemical studies were negative except for evidence of alkalosis. Sugar, 91 mg. per 100 c.c.; creatinin, 1.6 mg.; $CO_2$ combining power, 76 volumes per cent; urea, 23 mg.; whole blood chlorides, 440 mg. The stool gave a Grade 4 reaction for occult blood. It was alkaline in reaction and exhibited no excess of fat. Parasites were not found. The gastric analysis was unsatisfactory because of vomiting. The fasting residuum contained a large quantity of gross food. Bile present; HCl 45; acidity, 75. Gross blood, negative. Occult blood, +2. The microscopy was negative except for innumerable yeast-cells and food remains.

Gastrointestinal roentgenogram revealed an enormous stomach which for the most part was inactive, resembling extreme atony, but from time to time showed exaggerated hyperactive peristalsis. There was 90 per cent retention of the barium meal six hours after ingestion, 75 per cent retention after twenty-four hours, and 40 per cent retention in the stomach after forty-eight hours. The duodenal cap could not be filled out normally under the fluoroscope, but did show almost normal filling on several films. In addition to the retention in the stomach after forty-eight hours, barium was seen in the second and third portions of the duodenum, which appeared dilated, and in several coils of ileum. There were several large opacities visible on a level with the fourth and fifth lumbar vertebrae which were believed to be calcified mesenteric lymph nodes. They were identical on each film.

The patient is a young adult negro with obvious obstruction at or near the pylorus, showing laboratory evidence of alkalosis. Etiologically several conditions had to be considered. In any patient, particularly in the male sex, with a comparatively short (few months) progressive history of digestive trouble associated with weight loss, in whom upper intestinal obstruction is present, malignancy must be eliminated. Gastric malignancy seemed very unlikely to us because of the presence of a hyperacid gastric residuum and the absence of a gastric defect by roentgenogram. Cancer of the duodenum is extremely rare. The hyperacidity and occult blood in a stomach containing bile and occult blood in the stool might be explained by a duodenal ulcer.

Roentgen-ray studies did not definitely support such a diagnosis. There was no niche or defect in the duodenum which could be assumed to be due to ulcer. Duodenal ulcer would hardly explain the forty-eight hour retention in the second and third portion of the duodenum.

What part does the syphilis play? Syphilis of the stomach is comparatively rare and proved syphilis of the duodenum almost unknown. The absence of a gastric defect by roentgenogram and the presence of ample acidity militate against a diagnosis of gastric syphilis to account for the gastric retention. In view of the generalized enlargement of superficial glands, the possibility of luetic involvement of the mesenteric glands causing pressure on the pylorus and upper small intestine must be taken into account. Lastly, the suggestion of an old tuberculous process in the lungs, together with the visualization of large calcified mesenteric lymph glands brings up the possibility of tuberculous mesenteric lymphadenitis as the primary etiologic factor. Obstruction caused by mesenteric glands either luetic or tuberculous seem the most acceptable diagnosis.

Progress. With the marked gastric retention surgical intervention seemed essential. This could not be attempted until the chemical evidence of alkalosis was eliminated. A 10 per cent solution of glucose in 500 c.c. of salt solution intravenously was ordered on March 9. It is our practice to continue administration daily until the blood chemistry is normal. Only five such injections were given because of interruption by certain examinations up to March 19. On that date the urea had risen to 35 mg., but the $CO_2$ had returned to normal. At the completion of the studies on March 18 antiluetic therapy was instituted. Bismuth was selected (sodium potassium tartrobismuthate) rather than the arsenicals because of the uncertainty regarding the tuberculous process in the lung.

On March 18 the patient developed an acute follicular tonsillitis with bacteremia due to the streptococcus hemolyticus, which was quickly followed by a serofibrinous pleuritis and pericarditis and death on March 19.

Autopsy revealed the following:

1. A large chronic ulcer involving the anterior and lateral aspect of the first part of the duodenum. The base of the ulcer consisted of fibrous tissue. No duodenal tissue could be recognized. Chronic peritoneal adhesions existed between the gallbladder and the duodenum and pylorus. A marked thickening of the peritoneal coat of the gallbladder was noted. The stomach was enormously dilated, but the pylorus did not appear to be sufficiently closed to account for the degree of retention.

2. A generalized tuberculous lymphadenitis involving the mesenteric glands was present. Several large glands the size of limes were situated around the pylorus and head of the pancreas and undoubtedly were making pressure upon the pylorus and duodenum. A large scar of the spleen was thought by the pathologist, Dr. Case, to be a healed tubercle or infarct. Evidence of a healed tuberculous process of the right upper lobe and adhesive pleuritis of the left apex was found.

This case illustrates a rare cause for duodenal obstruction. A history of pleurisy, signs of a healed tuberculous process in the lungs, calcified abdominal glands visible by roentgenogram and a lymphocytosis were sufficient to cause a consideration of tabes mesenterica. The duodenal ulcer complicates the clinical picture somewhat, but did not account for the gastric retention, which was secondary to obstruction of the terminal duodenum.

That obstruction in the region of the terminal duodenum may be mistaken for pyloric obstruction is well illustrated by the following case (reported in *Medical Clinics of North America*):

Case 4. J. H., colored laundryman, age thirty-five years, was admitted January 20, 1927, complaining of stomach trouble for past four or five years. During this time attacks of epigastric pain occurred two or three hours after meals about once a month, not relieved by food or soda. Duration of attacks about one day. The attacks were accompanied by vomiting for one year previous to admission, which relieved the pain. For the past three weeks previous to admission vomiting was incessant. A hard nodular mass was felt in the left upper abdomen extending from the left costal margin to the level of the umbilicus, descending markedly with inspiration.

Gastric analysis: High normal acidity with marked biliary regurgitation. Occult blood negative. Stool: positive for occult blood. Blood chemistry: sugar, 70 mg. per 100 c.c.; $CO_2$, 68 vol. per cent; urea, 18 mg. per 100 c.c. Red blood cells, 3,950,000. Hemoglobin, 65 per cent. White blood-cells, 8000; polymorphonuclears, 69; small lymphocytes, 28; large lymphocytes, 2; transitionals 1.

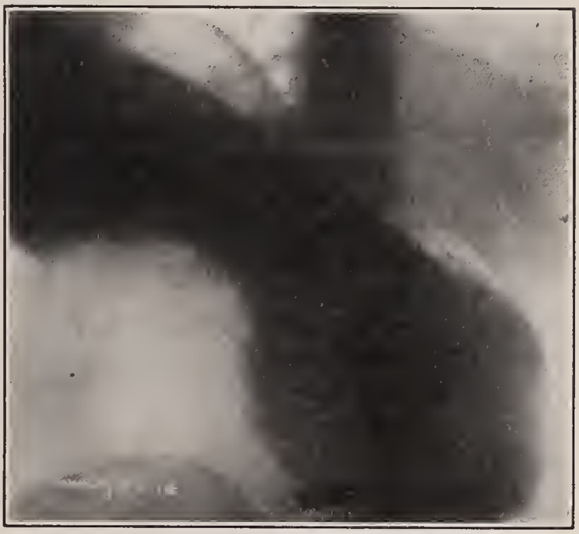

Fig. 8. Note dilatation of stomach with smooth subtraction defect on greater curvature.

On January 25 intractible vomiting and abdominal pain persist. Blood chemistry reveals an alkalosis. $CO_2$ 80 vol. per cent; blood chlorides 400 mg. per 100 c.c.; van den Bergh, 0.8 unit. Glucose and saline were administered by bowel and vein, which controlled the vomiting.

Roentgenogram (fig. 8) revealed an enormous dilatation of the stomach without any visualization of the duodenum. A large smooth indentation was present on the greater curvature of the stomach which resembled that due to outside pressure. This portion of the stomach was not fixed. Marked gastric retention was seen at twenty-four hours. Bromsulphalein liver functioo test was normal. Icterus index, 2 units; urobilinogen, normal.

The following conditions must be considered: (a) Obstruction at or near the pylorus associated with a high normal acid curve and long history pointing toward duodenal ulcer; (b) the left lobe of the liver is the most likely site of the mass which may be either luetic or malignant, and is pressing on but is not attached to the stomach.

Although the case was obviously surgical from the standpoint of pyloric obstruction, we decided to try antiluetic measures, feeling that if the mass were malignant it was certainly inoperable. Sodium iodide, 15 grains, was ordered on alternate days intravenously, together with mercurial inunctions. A hemolytic streptococcic bacteremia developed, but the patient died before serum could be administered.

The mass which we had felt in the upper left abdomen, about the size of a half orange, involved the jejunum, a loop of ileum and transverse colon. Before dissection it appeared as though a spontaneous anastomosis had occurred between the jejunum and the transverse colon, but this did not prove to be the case. The mesenteric lymph nodes which were a part of the mass were enormously enlarged, two of them reaching a diameter of 5 cm. A section of these glands showed the center to be of firm consistency, having a homogeneous yellowish-white color.

Upon opening the stomach and small intestine no evidence of disease was found in the stomach or upper duodenum which could account for the apparent pyloric obstruction. Just below the duonedojejunal junction the wall of the jejunum was thickened to about three times its normal breadth and extensive fibrosis of the intestine and mesentery was present. For an area about three cm. in width the mucosa of this part of the jejunum was covered with numerous shallow ulcerations, varying in diameter from 1 mm. to 1 cm. and giving the jejunum a moth-eaten appearance. Several inches below a similar ulcerated area was found. This condition resembled very much that seen in acute suppurative gastritis. The abdomen was free from fluid and there was no evidence of peritonitis.

The microscopic examination of the jejunum reported by Dr. Eugene Case shows multiple chronic ulcerations of the mucosa extending into the muscularis. The wall of the intestine was much thickened and there was a dense infiltration of large mononuclear wandering cells, many of which are phagocytes, lymphocytes and plasma cells. Lymph nodes of the mesentery showed a similar type of infiltration. There was no resemblence to tuberculosis. Lymph nodes were described as possibly gummatous and the process on the jejunum possibly syphilitic.

One might advance the theory that a chronic leutic involvement of the jejunum was the basic lesion with a superimposed subacute streptococcic infection which might have been lighted up by the intravenous administration of the iodide. The necropsy revealed no other focus for the hemolytic streptococcic infection. The inability to find the treponema by the Levaditi method makes it impossible to present this case as one of the jejunal syphilis.

The stomach was so enormously dilated in this instance that the duodenum could not be seen fluoroscopically or on the films. It was naturally assumed that the pylorus was the site of the obstruction. The pylorus and duodenum was patent down to the duodenojejunal junction. A chronic interstitial jejunitis and lymphadenitis probably luetic was the cause of the obstruction. An acute ulcerative jejunitis aparently developed while the patient was in the hospital. This case is particularly instructive in that it illustrates the fact that lesions of the duodenum may closely mimic pyloric obstruction. In extreme dilatation of the stomach the antrum may be so expanded anterior to the duodenum, that the latter structure cannot be seen. This difficulty is not encountered in mesenteric occlusion. The coexisting gastroptosis renders visualization of the duodenum easy.

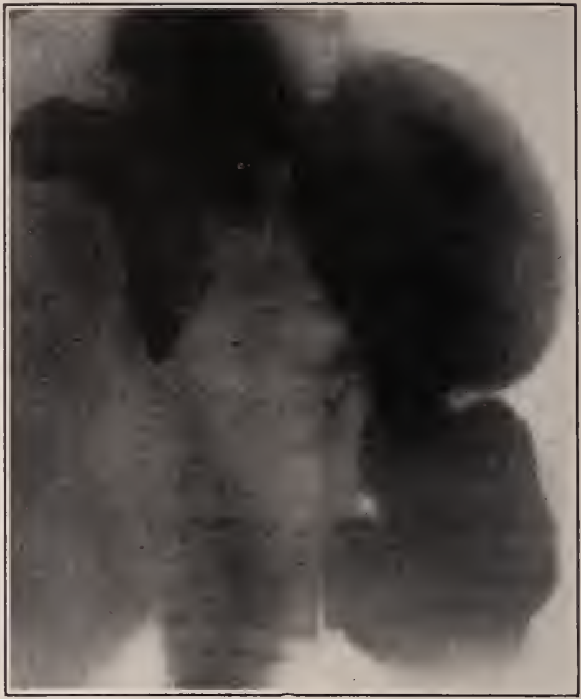

Fig. 9. Enormous dilatation of duodenum showing outline suggesting pressure from upper right abdomen due to hydatid cyst of liver.

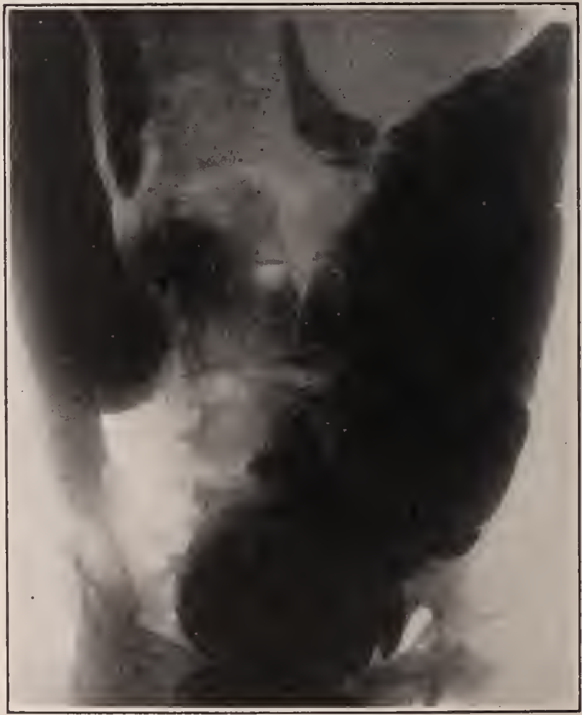

Fig. 10. Twenty-four hour retention in stomach and duodenum in case of hydatid cyst.

Another very rare abdominal lesion causing duodenal stasis was seen six months ago. A large mass occupying the upper right quadrant of the abdomen made sufficient pressure on the duodenum to produce partial obstruction at the third part of the duodenum. Twenty-four hour barium retention was noted in the stomach and proximal duodenum. An inspection of figures 9 and 10, reveals a duodenum shaped like a half moon, its concave surface being directed toward the liver. The mass was a large hydatid cyst about the size of a cantaloupe, involving the right lobe of the liver.

The pressure of any large tumor mass in the abdomen may be sufficient to produce stasis in the duodenum. A young woman was very recently seen with roentgen-ray evidence of duodenal stasis due to pressure of an enormous ovarian cyst.

Chronic pancreatic disease, either benign or malignant may produce duodenal stasis either by pressure or adhesions involving the duodenum. Stasis is probably present in many cases of enlargement of the head of the pancreas, but it is rarely of clinical importance.

Case 5. J. C., white male, came to the clinic complaining of fullness and belching immediately after eating and also attacks of pain and soreness in the left hypochondrium from two to three hours after meals with relief by eating. There was no loss of weight.

The physical examination was essentially negative. There was a grade four hyperacidity with slight delay in evacuating the Ewald meal. No gross or occult blood in the stomach or feces. Repeated attempts at duodenal aspiration were unsuccessful. No anemia. Blood serology negative and chemistry normal. Roentgenogram revealed a tapering of the antrum and pylorus and a very wide duodenal curve.

A diagnosis of carcinoma of the head of the pancreas was entertained, but constant improvement on an ulcer regimen ruled it out. There were no laboratory findings to confirm the suspicion of chronic pancreatitis. The patient remains much improved after five years without a definite diagnosis being made.

### GROSS PATHOLOGY WITHIN THE DUODENUM

Primary malignancy of the duodenum is rare. Eustermann[33] found but fifteen verified cases of primary cancer of duodenum at the Mayo Clinic up to 1925. Only three of these occurred in the infraampullary portion. Thus primary cancer of the terminal duodenum is so rare that it can practically be ignored as a cause of duodenal stasis. I have seen but one proven case of primary cancer of the duodenum. It occurred in the second part of the duodenum.

### PERIDUODENAL ADHESIONS (ACQUIRED)

Periduodenitis dependent upon adhesions to the gallbladder, although a rather important clinical entity, is a rare cause of duodenal stasis. The adhesions involve the duodenum in its first and second portion, so that stasis if it occurs, will be proximal to the third part. No difficulty should be encountered in differentiating cholecystic periduodenitis from mesenteric occlusion, the whole of the duodenum being widely dilated in the latter condition. The most frequent cause of deformities of the second portion of the duodenum is pathology in the gallbladder.

Case 6. J. B., a male physician, forty years of age, had been complaining of periodic attacks of pyrosis, regurgitation, vomiting and anorexia for fifteen years. He was underweight but showed nothing noteworthy on physical examination. Gastric acidity was slightly subnormal. Bile was present in the gastric extractions. The emptying time was somewhat delayed. Bile drainage revealed evidence of a catarrhal cholecystitis. There was no blood in the stomach or stools. A constant constricting type of defect was present in the second part of the duodenum, with dilatation proximal to the constriction. A diagnosis of adhesions involving the second part of the duodenum, probably cholecystic, was made.

Stasis in the upper duodenum is occasionally encountered in patients following operations on the gallbladder. I have recently seen a patient with multiple irregularities of the second portion of the duodenum with dilation and six hour barium retention proximal to the constriction. A cholecystectomy had been performed three years previously.

Duodenal stasis may follow a gastrojejunostomy. In two patients it was apparently dependent upon jejunal ulcer constricting the jejunum distal to the ostomy, causing enormous dilatation of the duodenum and jejunum proximal to the ostomy.

### DUODENAL DIVERTICULOSIS

Stasis may be confined to the diverticulum or the pouch, because of its size and location, may make traction or pressure on the lumen of the duodenum causing obstruction. Spriggs[34] in his classical article on intestinal diverticulosis describes finding duodenal diverticua thirty-eight times in one thousand consecutive radiologic examinations. Case[35] has published a series of eighty-five cases. Their combined statistics indicate the general characteristics of duodenal diverticulum. The pouches are usually single and the second part of the duodenum on the mesial surface is the commonest site. It is more frequent in women and the average age is about fifty-five years.

The differentiation between diverticulum and stasis due to other causes is usually easy. An enormous pouch of the terminal duodenum with a wide mouth might be easily confused with mesenteric occlusion of the duodenum, but careful fluoroscopy and plating should enable one to make a differential diagnosis. Duodenal diverticulum is very infrequent in the first portion. Only three per cent of all duodenal diverticula occur there according to some writers. The following case is of interest because of the possibility of diverticulum in this situation.

Case 7. J. G. B., a white male thirty-four years of age, had been experiencing attacks of late postprandial pain and discomfort in the epigastrium for three years. The chief complaint was quite suggestive of duodenal ulcer. Other symptoms were gaseous dyspepsia, neuralgia, anorexia and fatigue. He was markedly under weight.

A gastric succussion splash was elicited below the umbilicus. Otherwise the physical examination was not noteworthy. A normal acidity was found by gastric analysis but the emptying of the stomach was delayed. Duodenal intubation was accomplished. Food rests were present in the fasting duodenum as well as microscopic evidence of catarrhal duodenitis.

By roentgenogram a large diverticulum was seen extending out from the base of the greater curvature of the cap.

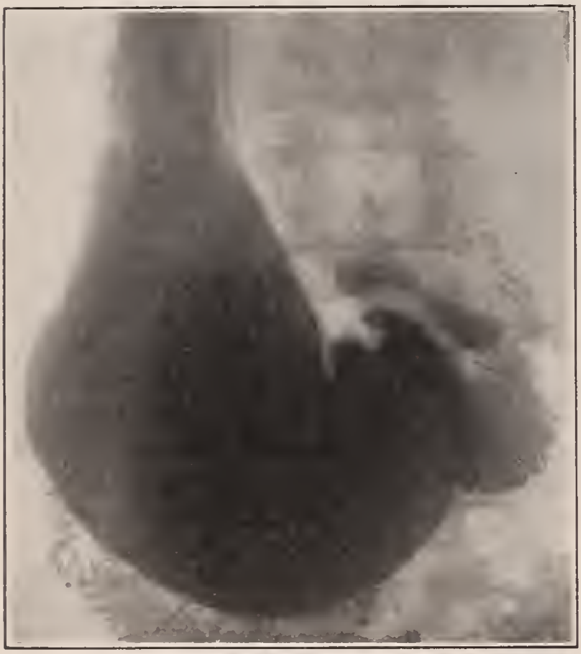

Fig. 11. Large diverticulum extending from base of cap on the greater curvature. Dilatation of duodenum proximal to spine.

The whole of the duodenum was dilated down to the point of its crossing of the spine. Barium was retained in the pouch, second and third portions of the duodenum and stomach at six hours (fig. 11). Marked antiperistalsis was visible in the midportion of the duodenum and a diagnosis of mesenteric occlusion of the duodenum was made. The pouching of the cap may have been dependent upon mesenteric occlusion of the duodenum, the latter condition causing distention of the duodenum with back pressure against a pylorus which failed to relax.

Kampmeier[36] reported a diverticulum in the same situation in a young woman. The above case is reported because of its unusual situation and the concomitant mesenteric occlusion which might account for its presence.

### DUODENAL STASIS AND SYPHILIS OF UPPER GASTROINTESTINAL TRACT

In a recent article[37] on gastroduodenal pathology in luetics mention was made of the high percentage of cases showing multiple roentgen defects in the esophagus, stomach or duodenum. Twenty-three cases having syphilis, gastric symptoms, and evidence of organic pathology by roentgenograms were analyzed. Six of them fulfilled the accepted clinical criteria necessary to the diagnosis of gastroduodenal syphilis. In seven other cases the lues seemed to play some part in the clinical picture presented. Of these thirteen cases, five had delay, dilatation or obstruction of the terminal duodenum. The essential lesions in these cases were: (1) gastric ulcer, bleeding, (2) diffuse luetic fibrosis involving the middle two-thirds of the stomach, (3) syphilitic lymphadenitis of the mesenteric glands obstructing the terminal duodenum (previously mentioned), (4) duodenal ulcer, distal half of cap, (5) ulcer-like defect in distal half of cap with achlorhydria.

In two of the five cases (1 and 2) marked delay in emptying of the terminal esophagus was also present. Three other cases, making five in all, presented esophageal delay. This tendency toward stasis in the esophagus and duodenum greatly exceeds any similar series of nonspecific lesions of the stomach and duodenum. We concluded that duodenal stasis, when present in association with a gastric or duodenal defect in a luetic patient, favored the diagnosis of lues as the primary etiologic factor. One can only speculate concerning this tendency toward duodenal stasis in gastric syphilis. Luetic involvement of mesenteric glands similar to that seen in case J. H. could account for the delay. Fibrosis or thickening of the root of the mesentery of the small intestine would likewise produce stasis by pressure on the terminal duodenum. The cause, whatever it may be, exerts its effect on the duodenum near its termination. It is proximal to this point that the dilatation and stasis is seen.

### GASTRIC HYPERMOTILITY

Extreme gastric hypermotility may induce a condition which radiologically simulates duodenal stasis. Almost immediately after the opaque mixture enters the stomach it enters the duodenum which appears dilated and may remain filled until the stomach is almost empty.

Case 8. A. A., a very apprehensive neurotic young Jewish man, complained of alternating attacks of constipation and diarrhea, and epigastric gnawing for seven years. Laboratory studies and physical examination were essentially negative.

Roentgen-ray study revealed a very striking gastrointestinal hypermotility. A film taken ten minutes (fig. 19) after the ingestion of barium shows the stomach more than half empty and the head of the meal in the terminal ileum. The whole of the duodenum seemed to be dilated. No other abnormalities were found except an extremely spastic irritable colon. A diagnosis of neurogenic spastic colitis was made. The subsequent observations seemed to confirm this impression.

This case illustrates the marked degree of gastrointestinal irritability which is encountered in cases of colitis of the neurogenic type. The apparent dilatation of the duodenum was probably due to distention as a result of rapid emptying of the stomach. This type of hypermotility is seen in some cases of achylia gastrica.

### TOXEMIA AND UPPER INTESTINAL OBSTRUCTION

Certain characteristic biochemical changes are seen in the more severe cases of obstruction of the duodenum. This condition is described as alkalosis or alkalemia and may cause severe toxic symptoms and rarely death. The alkalosis may be quite marked in the absence of symptoms.

The changes in blood chemistry are: (1) lessening in blood chlorides, (2) a shift of the acid base balance to the alkaline side shown by an increase in the carbon dioxide combining power of the plasma and an increase in hydrogen-ion concentration, and (3) a decrease in blood nonprotein nitrogen. These changes appear in the order given. Practically, an estimation of either whole blood or plasma chlorides, the carbon dioxide combining power of the plasma and blood urea are the necessary blood chemical studies. A whole blood chloride level of four hundred mg. or less, with a plasma carbon dioxide of 60 plus and an elevation of urea to 30-40 mg. is the ratio seen in mild cases. It is not unusual for the blood urea to mount well above one hundred mg. in severe cases. The blood creatinine rise is very slight as compared with the toxemia of nephrosis. If the plasma carbon dioxide reaches one hundred volumes per cent, tetany may occur. The urinary findings in alkalosis include a drop in the chloride excretion and a normal or increased urea output.

Cases of duodenal obstruction associated with alkalosis are surgical. The alkalosis must be corrected before surgery is undertaken. Measures to combat the dehydration must be instituted. Daily intravenous administration of chlorides and glucose will usually suffice. In mild cases three or four injections are often sufficient to overcome the alkalosis and toxemia. Calcium and parathyroid should be used if tetany is present. Simple duodenal stasis not dependent upon organic obstruction is rarely associated with alkalosis. An excellent review of this subject has recently been made by my associate, Shay.[38]

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# ACIDOSIS

## STUDIES AS PORTRAYED IN HOSPITAL CASE MANAGEMENT *

C. H. Hofrichter, A.B., M.D.
SEATTLE, WASH.

The term acidosis is a vague one and has fallen into disrepute in recent years. It is used by the laymen to represent acid conditions within the body in a very indefinite manner. In diabetes it is used to distinguish a condition presenting acid bodies within the urine and a group of clinical symptoms. These bodies are known as the ketones. When these ketones are found in the urine, it is taken for granted that they also exist within the blood. When present in the blood in sufficient quantities they are incompatible with life.

The ketone bodies are:

1. B-oxybutyric acid $CH_3$ CHOH $CH_2$ COOH
2. Acetoacetic acid $CH_3$ CO $CH_2$ COOH
   (called diacetic acid)
3. Acetone $CH_3$ CO $CH_3$

The great offender of these three is acetoacetic acid.

The chief source of the acetone bodies is from the fatty acids which form in the catabolism of fat. If one follows through the steps of the breaking down of the fat within the body it is believed to be:

1. Butyric acid
2. B-oxybutyric acid
3. $CO_2$ and $H_2O$

Some individuals seem to have difficulty in breaking down fat in this normal manner and this is particularly true of the diabetic individual. There is a great variance in the ability of individuals to utilize fat. Some will readily take care of twice as much as others. Following great temporary stress, such as in a postoperative period, many instances of this difference in ability to metabolize fat will be found through an acetonuria.

Von Noorden has sponsored the view that within the diabetic the fats cannot be burned properly because of the lack of sufficient utilization of sugar. In order for fats to be metabolized the carbohydrate fires must be burning vigorously, and then in the heat of this metabolic activity the fats are caught and utilized to a fruitful and satisfactory conclusion. Once let the carbohydrate fires die down and then the fats form abnormal toxic end-products which may prove to be the cause of death of the individual. The course which the fats follow in forming these toxic end-products is:

1. Butyric acid
2. B-oxybutyric acid $CH_3$ CHOH $CH_2$ COOH
3. Acetoacetic acid $CH_3$ CO $CH_2$ COOH
   (diacetic acid)
4. Acetone $CH_3$ CO $CH_3$

The protein is also a source of the formation of the ketone bodies. The protein breaks up into a glucose and a fatty acid portion. Fifty-eight per cent of the protein molecule is converted into glucose and 46 per cent into fatty acid. This fatty acid is felt to be a source of acetone as well as the fatty acid of the fat.

There are very definite changes within the blood. when this condition of acidosis exists. These definite changes may be determined, but there are probably other changes which are very complex and cannot be followed at the present time.

Within the blood are so-called buffer substances. These are the salts of the carbonates and phosphates, the hemoglobin and the protein. It is the function of these so-called buffers to combine with the acid substances when they present themselves, and so keep the reaction or hydrogen ion concentration of the blood on a very even basis. A slight change in the hydrogen ion concentration is not compatible with life.

The chemical balance of the blood, or the hydrogen ion concentration, is maintained constant in a large measure by means of the respiration, which washes out of the blood the $CO_2$ in the quantities necessary.

A very delicate mechanism exists in this respect. The $CO_2$ exists within the blood in two important ways. It is dissolved as $H_2CO_3$ and acts as a weak acid, and is combined in the blood as $NaHCO_3$ and acts as a weak base. These two substances, one an acid and one a base, balance each other.

If the acid portion $H_2CO_3$, consisting of the dissolved $CO_2$ becomes increased, the acidity stimulates the respiratory center, there is a greater minute volume of air handled, and the $CO_2$ is washed out of the blood, thus restoring the normal balance.

If the basic portion $NaHCO_2$ becomes too high, the alkali can be excreted by the kidney. If, then, an excessive acid condition exists within the blood, the following phenomena take place:

1. Stimulation of respiration and washing out of $CO_2$ and the $H_2CO_3$ becomes lower.

2. Some acid combines with the alkali and is

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* Read before a Meeting of the visiting staff at Seattle General Hospital, December 5, 1929.

excreted through the kidneys. This lowers the $NaHCO_3$.

3. The percentage of $CO_2$ in the expired air will fall as this varies directly with the amount of $CO_2$ within the blood.

If the functions of the body are pressed beyond the above mentioned means of handling, one may find that the kidney decomposes urea and produces ammonia which combines with and neutralizes the acid. Acid is also excreted by the kidney.

While this delicate and remarkable play of balance is constantly going on within the body, it is apt to be misleading when one studies it as a guide to the institution of adequate therapeutic measures.

For years many physicians felt that if the delicate acid base balance were disturbed by the presence of too great quantities of acid, the proper means to combat such a condition was the administration of alkalies in sufficient quantities to neutralize the excess of acid. So alkalies were administered. Very little outside of immediate neutralization was accomplished, however. It remained for someone to lay stress, not on the neutralization of a formed acid, but to stop the sources from which this acid was originating.

To grasp the fundamental factors as far as the formation of acetone and acetoacetic acid are concerned, we must focus our attention upon the breaking down of fat and protein within the body. As stated in a previous paragraph, when the fats break down properly the following steps are traversed: (1) Butyric acid, (2) B-oxybutyric acid, (3) acetic acid, (4) $CO_2$ and $H_2O$.

As also stated previously, when the fats do not metabolize properly, then in the third step in place of acetic acid, acetoacetic acid, or so-called diacetic acid is formed. This acid progresses into acetone. The steps then become the following: (1) Butyric acid, (2) B-oxybutyric acid, (3) acetoacetic acid, (4) acetone.

The acetoacetic acid is very toxic to the tissues of the body, and when present in sufficient quantities it causes death. Death from such cause is not infrequent, and the prevalence of acidosis with ketone bodies is common. Recently the Metropolitan Life Insurance Company reported 1,800 deaths from diabetes. Out of these 919 had not had the care which we know now to be the best for acidosis, namely the administration of glucose and insulin.

In our therapy we must strive to prevent the formation of acetoacetic acid, not to neutralize it after it is once formed. The means by which this is accomplished is very simple. For purposes of precision let us state the matter this way: *If carbohydrate is metabolizing properly in sufficient quantities, acetoacetic acid and acetone cannot be formed.*

It is essential, then, to get carbohydrates in sufficient quantities in some form into the patient suffering from acidosis and to get it metabolized. Carbohydrate may be provided in concentrated form in emergenices as: (1) Intravenous glucose, (2) oatmeal gruel, (3) orange juice and sugar.

As long as the patient can swallow it is not necessary to give intravenous glucose. Oatmeal gruel is well borne. Urge the gruel in small quantities at frequent intervals and support its administration with adequate amounts of insulin. For each two grams of carbohydrate retained, one unit of insulin may be given. Quantities of carbohydrate must be metabolized, as much as 200 grams in twenty-four hours. It seems heretical to give a diabetic patient in coma carbohydrate, but it is the metabolism of the excess of carbohydrate in the body together with the metabolism of the carbohydrate fed which is going to eliminate the formation of what is causing the coma, namely, the acetoacetic acid.

When one is dealing with the acute emergencies in acidosis, it is better to strip the therapy of all the protein and fat possible. Glucose and insulin are the life preservers to which we cling. It is a tenacious struggle against death and, may I say, a spectacular one. The reward which comes from good management is life itself. It is one of the great contributions of insulin that with it we can force the metabolism of carbohydrate and then literally work ourselves out of an acidosis.

After the immediate struggle is over, which should not be longer than twenty-four to forty-eight hours, one must alter the dietetic prescription and add gradually the amount of protein and fat which the patient can tolerate.

Three case records are presented to demonstrate the practical workings of the principles here discussed. A word of explanation in regard to the charts of these case records serves to make them more readily understood.

The numerical charts are self-explantory and carry the record of the urine, the dietetic orders and quantity of insulin. The graphic charts are compiled from the numerical. The numerals extending along the length of the charts represent grams of total glucose, calculated according to the Woodyatt method, grams of fatty acid and units

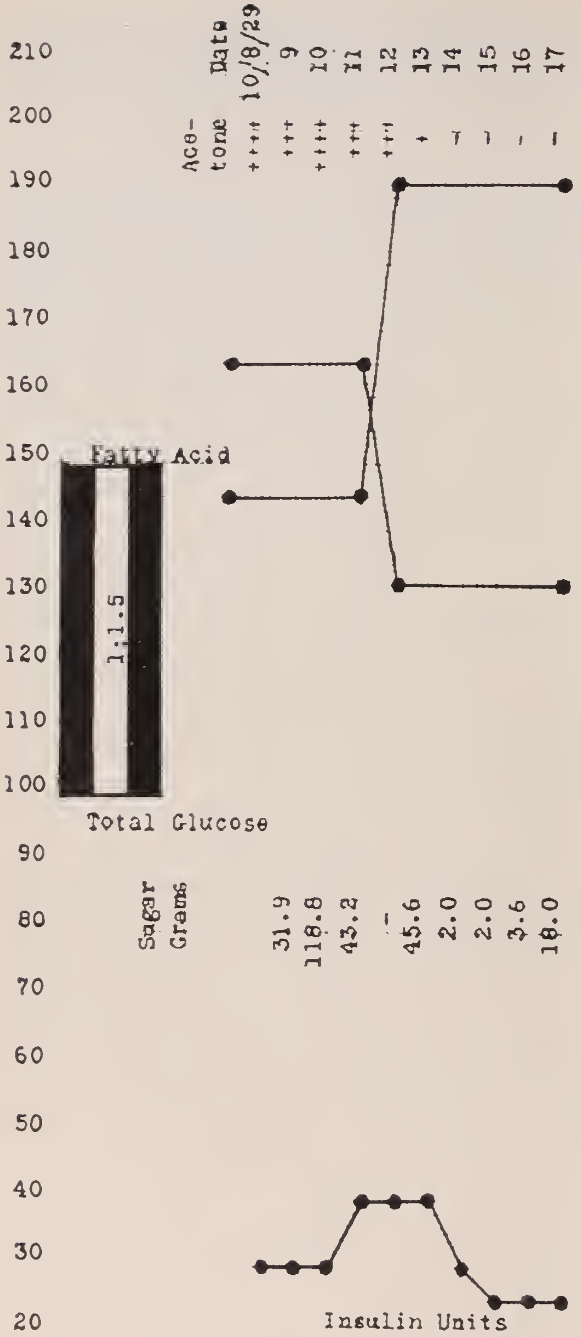

Fig. 1. Glucose-fatty acid ratio of 145:165+30 units of insulin results in acidosis.
Glucose-fatty acid ratio of 191:133+40 units of insulin eliminates acetone and sugar.
Extra units of insulin take care of 46 grams of glucose and clears up the excess spilling through.

of insulin. The two heavy lines with 1:1.5 represent a diet with 100 grams of total glucose and 150 grams of fatty acid, calculated after Woodyatt.

These values of total glucose and fatty acid have been chosen arbitrarily and fixed upon each chart in an identical manner, so that subsequent dietary prescriptions might have a background for

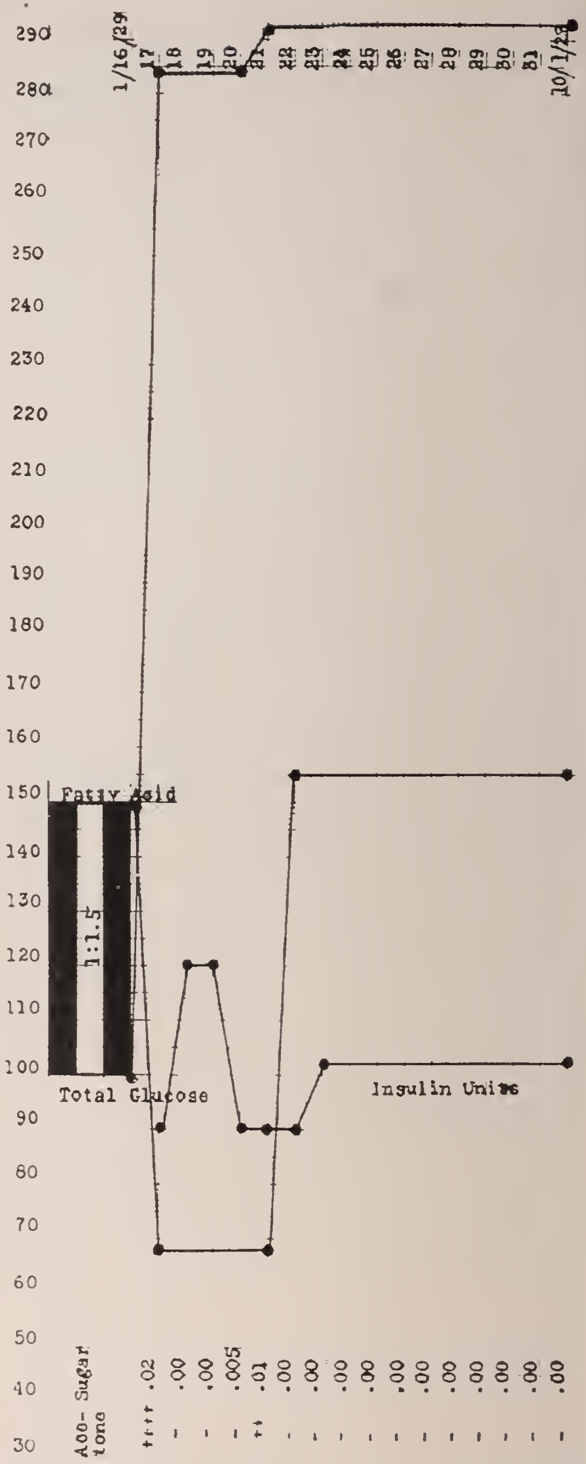

Fig. 2. On a glucose-fatty acid ratio 284:68, accompanied by a heavy insulin dosage, a moribund patient is restored to consciousness and the acidosis eliminated in approximately 36 hours.

comparison. This is not done in an effort to criticize the excellently built and adequate standard of Woodyatt, namely, that a glucose fatty acid ratio of 1:1.5 is a safe one to avoid acidosis. The purpose is to show that in the height of severe symp-

CASE No. 1

| DATE | VOL. C.C. | SP. GR. | ALB. | ACE-TONE | SUGAR % | GRAMS | C | P | F | CAL. | GLU. | FATTY ACID | INSULIN UNITS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | A.M. | NOON | P.M. |
| 10/ 8/29 | | 1044 | — | ++++ | .025 | | 100 | 50 | 160 | 2040 | 145 | 165 | 15 | 0 | 15 |
| 9 | | 1030 | — | +++ | .028 | 31.9 | 100 | 50 | 160 | 2040 | 145 | 165 | 15 | 0 | 15 |
| 10 | | 1040 | — | ++++ | .066 | 118.8 | 100 | 50 | 160 | 2040 | 145 | 165 | 15 | 0 | 15 |
| 11 | | 1030 | — | +++ | .04 | 43.2 | 100 | 50 | 160 | 2040 | 145 | 165 | 15 | 10 | 15 |
| 12 | | 1032 | — | +++ | .04 | | 150 | 50 | 125 | 1925 | 191 | 133 | 15 | 10 | 15 |
| 13 | | 1040 | — | + | .04 | 45.6 | 150 | 50 | 125 | 1925 | 191 | 133 | 15 | 10 | 15 |
| 14 | | 1020 | — | – | .00 | 2.0 | 150 | 50 | 125 | 1925 | 191 | 133 | 15 | 0 | 15 |
| 15 | | 1020 | — | – | .00 | 2.0 | 150 | 50 | 125 | 1925 | 191 | 133 | 15 | 0 | 10 |
| 16 | | 1020 | — | – | .005 | 3.6 | 150 | 50 | 125 | 1925 | 191 | 133 | 15 | 0 | 10 |
| 17 | | 1030 | — | – | .025 | 18. | 150 | 50 | 125 | 1925 | 191 | 133 | 15 | 0 | 10 |

CASE No. 2

| DATE | VOL. C.C. | SP. GR. | ALB. | ACE-TONE | SUGAR % | GRAMS | C | P | F | CAL. | GLU. | FATTY ACID | INSULIN UNITS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | A.M. | NOON | P.M. |
| 1/16/29 | | | | | | | 56 | 17 | 4 | | | | | 25 | 30 |
| 17 | | 1040 | +– | ++++ | .02 | | 250 | 50 | 50 | 1650 | 284 | 68 | 30 | 30 | 30 |
| 18 | | 1029 | – | – | .00 | 2.0 | 250 | 50 | 50 | 1650 | 284 | 68 | 30–20–20–30–20 | | |
| 19 | | 1014 | – | – | .00 | 2.0 | 250 | 50 | 50 | 1650 | 284 | 68 | 30–30–30–30 | | |
| 20 | | 1016 | – | – | .005 | | 250 | 50 | 50 | 1650 | | | 30 | 30 | 30 |
| 21 | | 1015 | +– | ++ | .01 | | 250 | 50 | 150 | 2550 | 294 | 158 | 30 | 30 | 30 |
| 22 | | 1010 | – | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 30 | 30 | 30 |
| 23 | | 1020 | +– | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 35 | 35 | 35 |
| 24 | | 1010 | – | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 35 | 35 | 35 |
| 25 | | 1022 | – | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 35 | 35 | 35 |
| 26 | | 1020 | – | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 35 | 35 | 35 |
| 27 | | 1011 | – | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 35 | 35 | 35 |
| 28 | | 1010 | – | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 35 | 35 | 35 |
| 29 | | 1018 | – | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 35 | 35 | 35 |
| 30 | | 1013 | – | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 35 | 35 | 35 |
| 31 | | 1014 | – | – | .00 | 2.0 | 250 | 50 | 150 | 2550 | 294 | 158 | 35 | 35 | 35 |

toms due to acidosis, we must temporarily resort to ratios far a-field from the proverbial 1:1.5. We must get rid of all the fatty acid we can and this is done with high carbohydrate, low fatty acid intake supported by adequate insulin dosage:

One graph represents the total glucose given each day.

One graph represents the total amount of fatty acid.

One graph represents the total insulin dosage.

The dates are recorded.

The percentage of sugar and qualitative acetone readings are given.

Each chart represents one case, and one case has four admissions into the hospital recorded.

Case 1. This case presents a child in acidosis. There is no immediate, acute emergency present, but the acetone is heavy, the child is drowsy, and the home has not adequately done its part in caring for the individual. Adjustment of the condition is necessary.

The first dietetic program of carbohydrate 100, protein 50, fat 160 results in a glucose-fatty acid ratio of 145:165 or 1:1-1. The supporting insulin was 30 units. This program accomplished nothing. The acetone did not go below three plus and the sugar output was heavy.

When the carbohydrate was raised materially and the fats lowered, and the insulin slightly raised, the acetone vanished. Notice how much more effectual the insulin is when the acetone is eliminated. The extra ten units of insulin takes care of the 46 grams of sugar added and the excess which has been spilling through. Apparently the needs here were for more carbohydrate, less fat and more insulin.

Case 2. This case represents a spectacular recovery of a moribund individual in a comparatively short period of time. The glucose-fatty acid ratio is 285:68 or 1:0.24. The dosage of insulin is high. This portrays the quick response to a high carbohydrate diet with a large dose of insulin.

Case 3. This case represents a severe infection in a patient suffering from diabetes mellitus. A diet of carbohydrate 60, protein 60, fat 170, with a glucose fatty acid ratio of 1:1.6 and an insulin dosage of 40 units did not bring the acetone below two plus, or the sugar below .013.

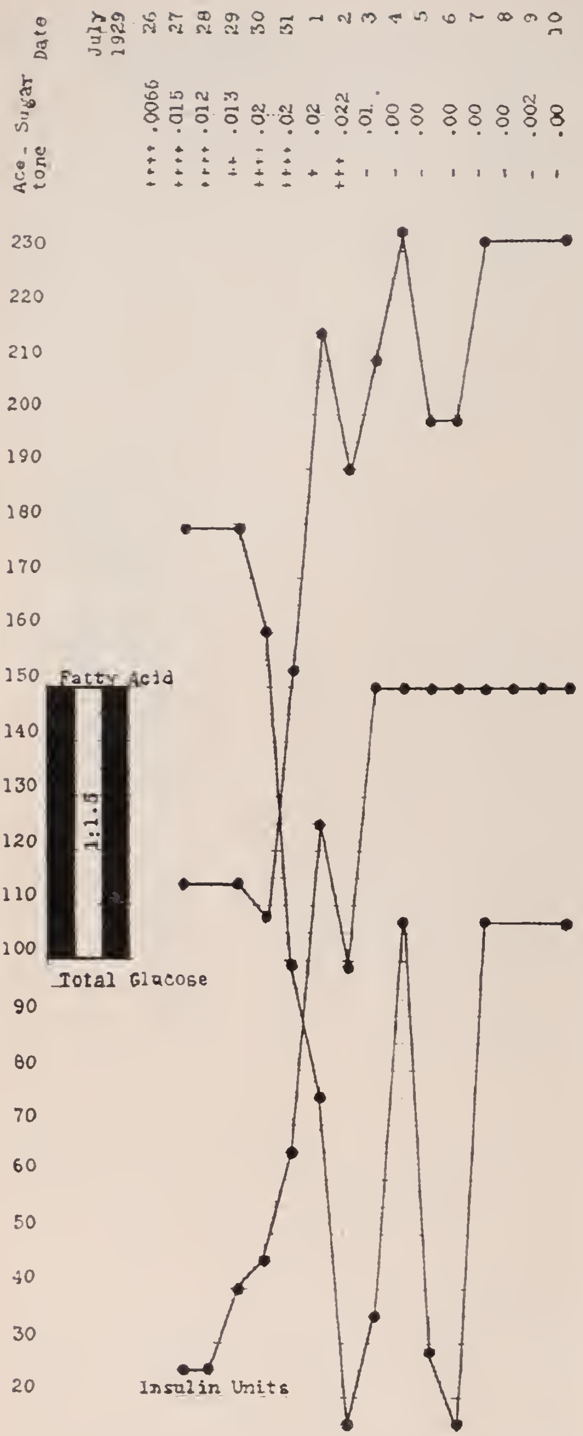

Fig. 3. When the glucose-fatty acid ratio was changed from 108:160 to 216:74, there was immediate clearing up of acidosis.

A heavy dose of insulin had to be used to support the high carbohydrate feeding.

A dosage of insulin which permits a percentage of sugar of .013 is not adequate, but this is not the entire fault.

A radical change to a high carbohydrate, low fat program accomplishes the elimination of the acidosis. This is worked out with the approximate values of carbohydrate 180, protein 40, fat 30, and insulin 100 units. Here the 1:1.5 ratio of glucose to fatty acid used must give way in the storm of impending failure to an approximate ratio of 1:0.20.

Case 4. The factors for consideration in this instance are many. In the first admission one sees the rapid response as portrayed in the diminution of the acetone, when subjected to pressure of high carbohydrate feedings and high insulin administration. It is also interesting to notice the disappearance of the albumin as the body chemistry assumes a more natural balance. Apparently the kidney is irritated by the necessity of excreting the abnormal end-products of metabolism.

The second admission of this case into the hospital is most interesting. There has been severe abdominal pain, with vomiting and tenderness over the gallbladder. This in the absence of acetone was diagnosed as cholecystitis with cholilithiasis, and the presence in the hospital was for cholecystectomy. The gallbladder was successfully removed and the diagnosis substantiated.

Those interested in preparing cases of diabetes for surgical procedures will find, by studying the preparation in the days preceding operation, a means of giving good metabolic support in the postoperative period. The substance of the desire in these cases is to get the liver as full of glycogen as possible before starting, and to keep sufficient glucose metabolizing in the postoperative period to avoid the acidosis. One must be exceedingly nimble in the postoperative period and inhibit the development of the ketone bodies. These bodies can appear in large quantities between two voidings as seen upon the chart. Intravenous glucose may be necessary for a short period in the postoperative phase of management.

The third admission is again for acute acidosis with ready response. This carries us back to the first admission. The response is considerably sharper in this effort.

The fourth admission was for observation for abdominal pain. No acidosis was present. This case never did tolerate fat well, and one always had to be exceedingly careful not to feed too much of this food. The ratio of one gram of total glucose to 1.5 grams of fatty acid was never possible here.

It is hoped that this report on these four cases will serve to establish interest in those struggling with the problems of acidosis, and give some suggestions for the type of management best suited.

CASE No. 3

| Date | Vol. c.c. | Sp. Gr. | Alb. | Acetone | Sugar % | Grams | C | P | F | Cal. | Glu. | Fatty Acid | Insulin Units | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | a.m. | noon | p.m. |
| 7/26/29 | | 1030 | +− | ++++ | .006 | | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 27 | | 1024 | +− | ++++ | .01 | | 60 | 60 | 170 | 2010 | 112 | 179 | 10 | 5 | 10 |
| 28 | | 1020 | − | ++++ | .012 | | 60 | 60 | 170 | 2010 | 112 | 179 | 10 | 5 | 10 |
| 29 | | 1030 | − | ++ | .013 | | 60 | 60 | 170 | 2010 | 112 | 179 | 10 | 15 | 15 |
| 30 | | 1023 | − | ++++ | .02 | | 60 | 60 | 148 | 1812 | 108 | 160 | 15 | 15 | 15 |
| 31 | | 1020 | − | ++++ | .02 | | 117 | 50 | 85 | 1433 | 154 | 98 | 15 | 25 | 25 |
| 8/ 1/29 | | 1020 | − | + | .02 | | 186 | 42 | 62 | 1470 | 216 | 74 | 125 | | |
| 2 | | 1018 | − | +++ | .022 | | 185 | 24 | 5 | 881 | 190 | 15 | 98 | | |
| 3 | | 1012 | − | − | .01 | | 196 | 30 | 19 | 1075 | 210 | 35 | 98 | | |
| 4 | | 1006 | − | − | .00 | 2.0 | 200 | 40 | 100 | 1860 | 233 | 108 | 150 | | |
| 5 | | 1008 | − | − | .00 | 2.0 | 184 | 21 | 21 | 1009 | 198 | 28 | 150 | | |
| 6 | | 1024 | − | − | .00 | 2.0 | 185 | 24 | 5 | 1881 | 199 | 15 | 150 | | |
| 7 | | 1010 | − | − | .00 | 2.0 | 200 | 40 | 100 | 1860 | 233 | 108 | 150 | | |
| 9 | | 1010 | − | − | .02 | | 200 | 40 | 100 | 1860 | 233 | 108 | 150 | | |
| 10 | | 1020 | − | − | .00 | 2.0 | 200 | 40 | 100 | 1860 | 233 | 108 | 150 | | |

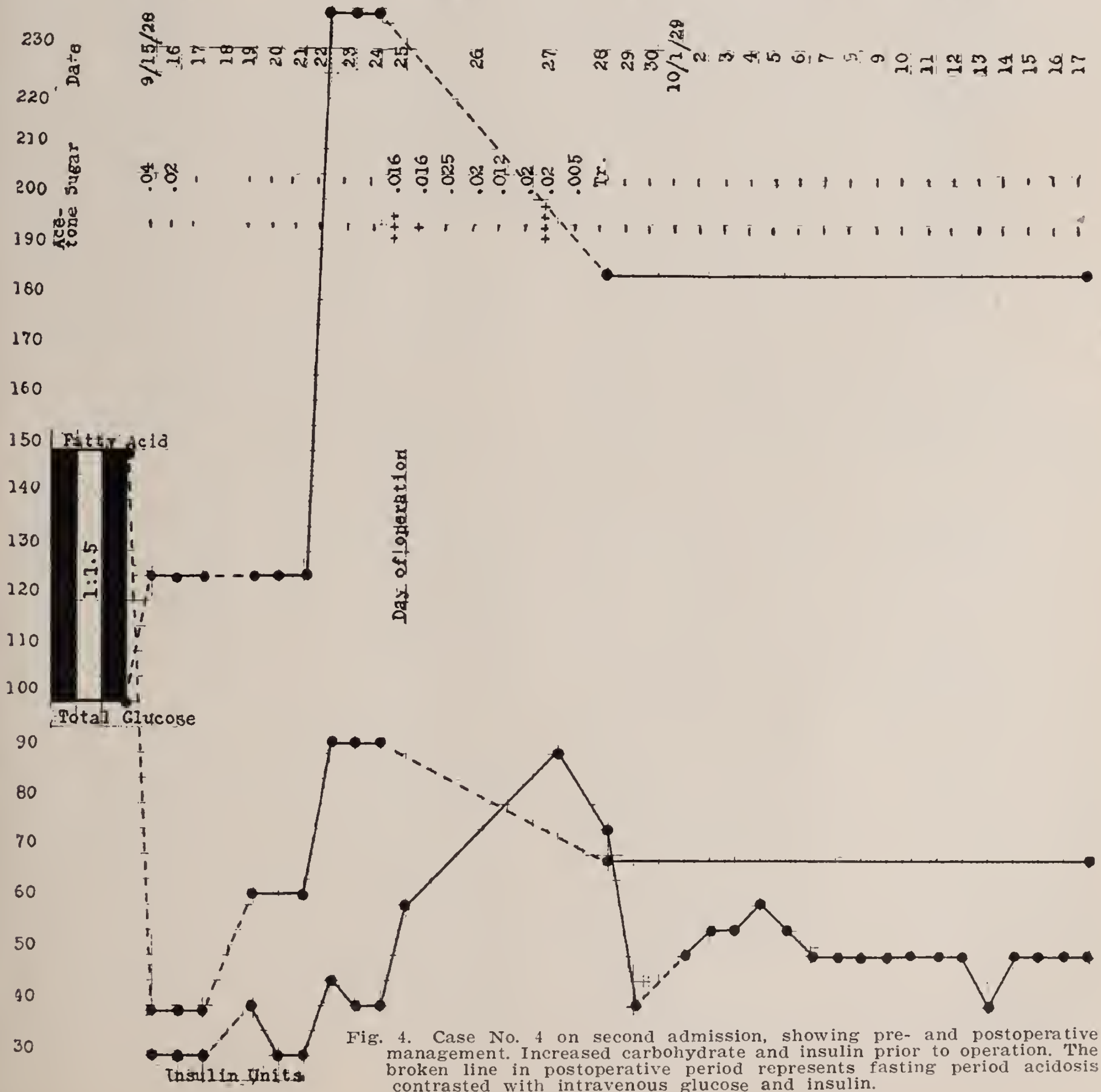

Fig. 4. Case No. 4 on second admission, showing pre- and postoperative management. Increased carbohydrate and insulin prior to operation. The broken line in postoperative period represents fasting period acidosis contrasted with intravenous glucose and insulin.

### CASE No. 4—FIRST ADMISSION

| DATE | VOL. C.C. | SP. GR. | ALB. | ACE-TONE | SUGAR % | GRAMS | C | P | F | CAL. | GLU. | FATTY ACID | INSULIN UNITS A.M. | INSULIN UNITS NOON | INSULIN UNITS P.M. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6/16/28 | | 1020 | Heavy | ++++ | .008 | | 130? | | | | | | 10–10–30–20 | | |
| 17 | | 1022 | Heavy | ++++ | .005 | Oatm | eal gru | el 4ʒ q | 15 m? | | | | 15–15–15–20–10–10–10–10–10–10 | | |
| 18 | | 1010 | Heavy | + | .028 | | 126 | 60 | 100 | 1644 | 170 | 115 | 20 | 20 | 20 |
| 19 | | — | Heavy | – | .00 | 2.0 | 126 | 60 | 100 | 1644 | 170 | 115 | 20 | 20 | 20 |
| 20 | | 1020 | Tr. | + | .00 | 2.0 | 126 | 60 | 100 | 1644 | 170 | 115 | 20 | 20 | 20 |
| 21 | | 1010 | F.T. | + | .00 | 2.0 | 126 | 60 | 100 | 1644 | 170 | 115 | 20 | 20 | 20 |
| 22 | | 1010 | — | + | .00 | 2.0 | 126 | 60 | 100 | 1644 | 170 | 115 | 20 | 20 | 20 |

### SECOND ADMISSION

| DATE | VOL. C.C. | SP. GR. | ALB. | ACE-TONE | SUGAR % | GRAMS | C | P | F | CAL. | GLU. | FATTY ACID | INSULIN UNITS A.M. | INSULIN UNITS NOON | INSULIN UNITS P.M. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/15/28 | | 1016 | — | – | .04 | | 100 | 40 | 25 | 785 | 126 | 39 | 10 | 10 | 10 |
| 16 | | 1020 | Tr. | – | .02 | | 100 | 40 | 25 | 785 | 126 | 39 | 10 | 10 | 10 |
| 17 | | 1020 | F.T. | – | .00 | 2.0 | 100 | 40 | 25 | 785 | 126 | 39 | 10 | 10 | 10 |
| 19 | | 1016 | — | – | .00 | 2.0 | Oatm | eal gru | el | | | | 10–10–10–10 | | |
| 20 | | 1012 | — | – | .00 | 2.0 | 100 | 40 | 50 | 1010 | 128 | 63 | 10 | 10 | 10 |
| 21 | | 1005 | — | – | .00 | 2.0 | 100 | 40 | 50 | 1010 | 128 | 63 | 10 | 10 | 10 |
| 22 | | 1010 | F.T. | – | .00 | 2.0 | 200 | 50 | 75 | 1675 | 237 | 91 | 15 | 15 | 15 |
| 23 | | 1008 | — | – | .00 | 2.0 | 200 | 50 | 75 | 1675 | 237 | 91 | 10 | 15 | 15 |
| 24 | | 1006 | F.T. | – | .00 | 2.0 | 200 | 50 | 75 | 1675 | 237 | 91 | 25 | 0 | 15 |
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| 26 | | 1022 | Tr. | – | .02 | | | | | | | | 15 | 15 | 15 |
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| 27 | | 1032 | F.T. | ++++ | .02 | | | | | | | | 15–30–15–15–15 | | |
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| 28 | | 1024 | F.T. | – | Tr. | | 151 | 49 | 51 | 1289 | 185 | 68 | 10–10–20–10–10–15 | | |
| 29 | | — | | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 10–10–10–10 | | |
| 10/1/28 | | 1020 | — | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 10–10–10–10–10 | | |
| 2 | | 1014 | — | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 15–10–10–10–10 | | |
| 3 | | 1018 | — | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 10–10–10–15–10 | | |
| 4 | | 1018 | — | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 15–15–10–10–10 | | |
| 5 | | 1011 | — | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 15–15–10– 5–10 | | |
| 6 | | 1013 | F.T. | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 10–10–10–10–10 | | |
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| 8 | | 1010 | — | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 10–10–10–10–10 | | |
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| 14 | | 1008 | — | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 10–10–10–10–10 | | |
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| 17 | | 1010 | — | – | .00 | 2.0 | 151 | 49 | 51 | 1289 | 185 | 68 | 10–10–10–10–10 | | |

THIRD ADMISSION

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| 7 | | 1020 | Tr. | – | | | 244 | 40 | 8 | 1136 | 268 | 25 | 20–20–20–20–20–20–20 |
| 8 | | 1004 | — | – | | | 244 | 40 | 8 | 1136 | 268 | 25 | 20–20–20–20–20–20–20 |
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| 9 | | 1028 | — | – | | | 244 | 40 | 8 | 1136 | 268 | 25 | 20–20–20–20–20–20–20–20 |
| | | 1006 | — | – | | | | | | | | | |
| 10 | | 1023 | — | – | | | 244 | 40 | 8 | 1136 | 268 | 25 | |

FOURTH ADMISSION

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| 9/ 9/29 | | 1010 | — | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
| 10 | | 1006 | — | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
| 11 | | 1005 | — | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
| 12 | | 1020 | — | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
| 13 | | 1008 | — | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
| 14 | | 1010 | — | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
| 15 | | 1010 | — | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
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| 19 | | 1005 | — | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
| 20 | | 1005 | F.T. | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
| 21 | | 1010 | — | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
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| 23 | | 1004 | Tr. | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |
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| 25 | | 1004 | Tr. | – | .00 | 2.0 | 100 | 40 | 60 | 1100 | 129 | 62 | 10–10–10–10 |

# CHYLOUS CYST OF THE MESENTERY

Thomas M. Joyce, M.D.
Martin A. Howard, M.D.
John H. Fitzgibbon, M.D.
PORTLAND, ORE.

Cysts of the mesentery are considered quite rare. In 1900 Dowd[1] made an historical study of the literature and found records of 145 cases. Since then it has been estimated that between 200 and 300 cases of mesenteric cysts of all varieties have been recorded. Real chylous cysts are rare indeed. As early as the sixteenth century Benivieni,[2] a Florentine anatomist, described these cysts as "anatomic curiosities." Portal,[3] in 1803, classified the number of cases that had been reported. In 1842 Rokitansky[4] first described chylous cysts of the mesentery at autopsy. In 1897 Moynihan[5] presented nine cases of mesenteric cyst. Some of the men who have more recently discussed chyle cysts are Levison,[6] Lang[7] and Clark.[8] Probably the last case to be found in the literature is a chylous cyst of the mesentery reported by Lang[7] in the *Canadian Medical Journal* in May, 1928.

Because of the rarity of chylous cysts we thought it advisable to place this case on record.

J. U., male, aged 39, Prussian, welding business.

*Family history.* Father died of carcinoma at 65. Mother living and well. Wife living and well. Three children living and well.

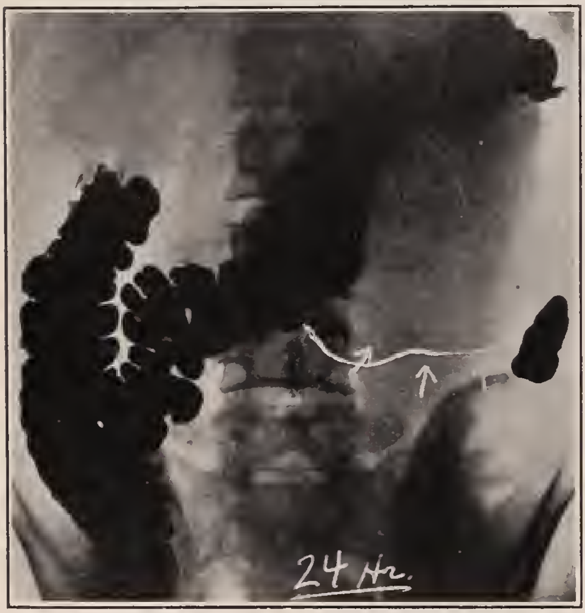
*Past history.* Negative except for influenza and pneumonia in 1918. No history of veneral disease.

*Present complaint.* Abdominal distress for two weeks. Constipation for three or four months. Loss of appetite. Loss of weight and strength.

*Present illness.* Until four months ago patient had always been quite healthy with the exception of slight constipation. During the last four months the constipation has been more marked, requiring more frequent laxatives. Recently, however, he has had three to four loose stools a day. About two weeks ago he began to have a dull ache, accompanied by a cramping distress, throughout his abdomen, coming on just before and after meals. At times this was also accompanied by a lower dorsal backache. Foods seemed to increase the distress. There was no nausea and no vomiting. For the last three weeks there has been a definite fullness, pressure and rumbling throughout the abdomen. During the last two months patient has lost about fifteen pounds in weight and has lost correspondingly in strength.

*Physical examination.* Patient was well nourished. Skin was rather sallow. The head, neck, lungs and heart were negative. Blood pressure was 110-74. Pulse rate was 72. Palpation of the abdomen revealed an irregular mass in the upper left quadrant, about the size of a baby's head; no definite edge felt and no notches; moved slightly with respiration. Rectal examination was negative. The reflexes were active and equal. Urine was normal. Stools were normal. Blood count showed the following: Hemoglobin 84 per cent; erythrocytes, 3,216,000; leucocytes, 11,120; polymorphonuclears, 63 per cent; small lymphocytes, 25 per cent; large lymphocytes, 6 per cent; transitionals, 2 per cent; eosinophiles, 2 per cent. Ewald test meal: 5 c.c. removed; no blood present; free hydrochloric acid 29; total acidity 46; no bile present.

*Roentgen-ray examination.* A flat plate of the abdomen showed a large shadow extending down below the ribs on the left side, measuring five inches in diameter. The left kidney, which was seen well above this shadow, was slightly increased in size. A pyelogram showed both kidneys to be of normal size and position, thus ruling out any kidney lesion. Screening of the stomach revealed a large defect on the greater curvature margin, a defect due to pressure from the large mass in the left upper quadrant, an outline of which could be seen on all films taken in the standing position. One hour after the meal the stomach was found to be empty. Barium enema showed only slight pressure on the colon from the mass. The colon was above and lateral to the mass.



Twenty-four hours after barium meal. The cyst is outlined in white ink. Note the pressure on descending colon.

*Diagnosis.* The differential diagnosis was (1) pancreatic cyst, (2) mesenteric cyst, (3) omental cyst, (4) splenic tumor. Because of the unusual mobility of the tumor, the diagnosis of mesenteric or omental cyst was favored and operation advised. However, the patient did not come to operation until two months later (April 4, 1929).

*Operation.* A left rectus incision was made. A cyst about 10x7x4 inches was found on the left side of the mesentery, just below the duodenojejunal juncture. It was quite freely movable and appeared to be attached to the tail of the pancreas. The cyst was carefully dissected out. It proved to be a mesenteric cyst and was attached to the pancreas only by a small adhesion. The posterior peritoneum was carefully sutured and the abdomen was closed without drainage.

*Postoperative history.* Patient left the surgery in fine condition, as there had been very little bleeding. He had quite a smooth convalescence and left the hospital on the sixteenth day.

*Pathologic report.* Gross: The specimen was an oval mass, measuring 8x12x14 centimeters. It contained 500 c.c. of thick, whitish fluid, strongly resembling thick cream. Many fat droplets were visible. Microscopic: Sections of the cyst wall revealed a structure composed of large elongated and branching cells, fibrous in nature. There were many small lymphocytes and many small channels having the appearance of lymph vessels. Blood vessels were not numerous.

*Pathologic diagnosis.* Large chylous cyst of the mesentery, containing lymphoid cells and lymph vessels.

### ETIOLOGY

Mesenteric cysts occur in both sexes in about equal numbers. They are seen most frequently in persons between thirty and forty years of age, but may occur at any age. It has never been determined whether they are of embryonic origin or whether they are retention cysts, due to the efferent lymph vessel being closed.

### CLASSIFICATION

Tyler in his applied anatomy classifies them as cystic tumors of the mesentery, usually of lymphatic origin. (a) Serous, contents clear and watery. (b) Chylous, contents thick and creamy.

### SYMPTOMS

The symptoms are often quite vague and usually referable to the gastrointestinal tract. The patient may complain of fullness, loss of appetite, nausea, vomiting and constipation, the symptoms depending upon the size and position of the cyst. A common symptom is a dull, aching pain, often accompanied by alternating diarrhea and constipation. In certain cases a definite obstruction may occur. The tumor mass is freely movable and one is impressed with its extreme mobility. There is an area of tympany in front of the tumor, due to the gas-filled bowel. There is no palpable edge.

### TREATMENT

The treatment is entirely surgical. The methods most commonly used are (1) enucleation, (2) incision and drainage, (3) marsupialization and (4) aspiration. Of course, enucleation is by far the operation of choice and certainly offers the best results.

### PROGNOSIS

The prognosis in these cases appears to be very good. Benedict[9] analyzed 97 cases. Sixty of them were completely cured, twelve were diagnosed at autopsy and fourteen died postoperatively. Eleven of them he was unable to trace. All of the more recent cases reported have recovered.

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# SURGICAL TREATMENT OF CARDIOSPASM*

O. F. Lamson, M.D., F.A.C.S.
SEATTLE, WASH.

The spasmodic stricture of the lower end of the esophagus is generally termed cardiospasm, though investigators have shown that the cardia is not necessarily involved. Generally the constriction takes place by the action of the diaphragmatic musculature at the hiatus esophagus. Hence phrenicospasm may be a more accurate term. Some authorities assert that the spasm is due to the contraction of the entire abdominal esophagus. A brief consideration of the anatomy of the esophagus may help us in our consideration of this disease.

The esophagus begins at the lower border of the cricoid cartilage near the disc between the sixth and seventh cervical vertebrae, and ends below the diaphragm, opposite the tenth or eleventh thoracic vertebra. About four inches below its beginning it deviates slightly to the left, and then descends nearly straight downward to about three inches above the diaphragm at the left of the midline. There are three constricting points: at the beginning, four inches below where the left bronchus crosses the esophagus, and at the diaphragmatic opening.

The esophagus is the most muscular part of the alimentary canal. Its tissues are very elastic, capable of stretching a great deal. It varies in size from three-fifths to four-fifths of an inch in diameter. Its average length is about ten, although it may vary from eight to fourteen inches.

Physiologically the function of a normal esophagus is to carry food onward to the stomach through peristaltic waves. Semifluid and fluid substances, according to Cannon and others, are projected by the contraction of the mylohyoid muscles to the cardia, and thence pass into the stomach. It has a definite mechanism to prevent regurgitation of food. Jackson speaks of it as "the diaphragmatic pinch cock." Therefore, it is possible for an acrobat to stand on his head with a full stomach, without its contents passing back into the esophagus.

On account of its small caliber and the constricting points mentioned, the esophagus is subjected to more trauma than any other part of the alimentary canal. Too hot, too cold or excessively irritating foods or drinks undoubtedly account for the frequent occurrence of cancer of the esophagus, particularly at the cardiac region.

Cardiospasm is a disease in which there is a constriction at the lower end of the esophagus, very likely where it passes through the diaphragmatic opening. Patients complain of a definite chain of symptoms, such a dysphagia, sensation of food "sticking" in some portion of the esophagus, usually in the lower end, regurgitation of foods during and after meals, loss of weight which in some cases is not great, while in others it may amount to emaciation. Usually there is some pain and discomfort at the lower end of the sternum. The dilatation of the esophagus may be so great that it may contain two or three times as much as a normal stomach.

Two factors enter into the enormous dilatation of the esophagus. We may think, first of all, of the constriction at the lower end; second, of the attempt of the esophagus to overcome this constriction by active peristaltic waves, and the reverse of the peristaltic waves, when the food strikes the obstacle. Undoubtedly this churning process plays a very important part in the dilatation.

When a certain amount of dilatation has taken place by the above mentioned process, there is another factor which promotes further dilatation, the weight of the column of food from the mouth to the cardia. As I have had patients tell me, to overcome their difficulty they would eat large quantities of bread and drink considerable water. Evidently the weight of food and liquid would cause further dilatation, and temporarily overcome the spasm, thereby permitting them to finish their meal with greater ease.

The etiology of cardiospasm has always been of great interest to me. Various causes with associated dilatation of esophagus have been advanced. It is considered by some authorities as a congenital disease. Mosher claims that the liver tunnel is one of the principle causes of cardiospasm. He states that the tunnel is present at birth, and can be demonstrated by roentgenogram. He attributes the constriction of the esophagus at the cardia to the pressure of the liver. He has made rather exhaustive researches to prove his assertion and it seems quite plausible that the pressure of the liver may be of importance in producing this condition in some cases. If the liver tunnel was as big a factor in the production of cardiospasm as Mosher claims it is, it seems to me it should be more often found with hypertrophy of the liver. This, I believe, is not the case.

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* Read before the Annual Meeting of Western Surgical Association, Chicago, Ill., Dec. 15, 1928.

Others give paralysis of the vagus nerve as a cause of dilatation of the esophagus. Some have considered neurosis as one of the chief factors, while others think it is caused by lesions further down in the alimentary canal, such as gallbladder disease, appendicitis and gastric ulcers, and that cardiospasm is merely a defensive act of nature to exclude the irritating food from the diseased part.

In a paper I read before King County Medical Society some thirteen years ago, I suggested as a possible cause for cardiospasm the sphincteric effect of the diaphragm. That is, that the diaphramatic opening, through which the esophagus passes, either congenitally or through irritation develops a strong sphincteric action on the esophagus, causing what we term "cardiospasm." Jackson speaks of the "pinch cock action of the diaphragm on the esophagus," expressing the same thought in different words.

The enormous dilatation in most cases results in the loss of muscular tone of the esophagus, and subsequent loss of its normal peristaltic action for the passage of solid food into the stomach. Therefore, a large, dilated, nonfunctioning esophagus must resort to another method to empty its contents. I consider this to be largely by gravity, and the inactive esophagus acts merely as a connecting tube between the mouth and the stomach.

If the esophagus, during the process of dilatation, has not become very much angulated and elongated, as sometimes happens, the patient does not suffer any great discomfort, even though the esophagus has practically lost its peristaltic action, if the cardiospasm has been thoroughly dilated. In others, with a large dilated and angulated esophagus, it may not empty itself, even after the thorough dilatation of the cardiospasm, due to the fact that the lower end of the esophagus has become a large pouch resting on the diaphragm unable to fully empty itself. Only the overflow can pass on into the stomach.

The mechanical aspect of this type of cardiospasm, with a large residual amount of food and fluid constantly remaining in the esophagus, is not unlike that which causes residual urine in the bladder in hypertrophied prostate. I have had under observation for the last twelve years such a case, which I have dilated in that time fifty or sixty times with the Plummer dilator. Yet I have never felt fully satisfied in the treatment I was giving this patient. Because I found that, in spite of the thorough dilatation of the cardiospasm, he did not obtain adequate relief. There always remained in the esophagus large quantities of foods and liquids to ferment. Naturally there would be absorption of toxins from this fermentation. It occurred to me that this type of case required surgical treatment fo radequate relief (fig. 1).

Before entering into the discussion of the surgical procedure of this type of cases particularly, I wish to review briefly the treatment of cardiospasm. Plummer of the Mayo Clinic was one of the pioneers in developing an efficient, simple method of treatment. I am satisfied that fully ninety-five per cent of cases, if not more, can be treated by some such method of dilatation without surgical interference.

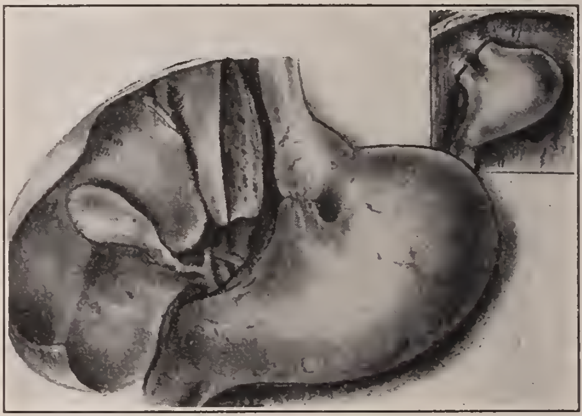

Fig. 1. Roentgenogram showing S shaped esophagus, in which dilated pouch of esophagus rests on the diaphragm.

To the discussion of this five per cent or under I wish to confine myself. Walton, in a recent number of the *British Surgical Journal,* gave a rather exhaustive report of sixteen cases which he treated by the Mikulicz method, that is, by a gastrotomy large enough to admit the hand for digital dilatation of the cardiospasm. His argument for this procedure was that the constrictions were so small that they were unable to successfully treat them by the Plummer method. From the radiographs shown in his articles, the dilatation of the esophagus was not extreme in any of his cases.

Judging from the appearance of his radiographs, it would seem that the Plummer treatment should have produced good results in most of his cases, if the dilatations were repeated sufficiently to insure thorough dilatation. His article is a splendid review of the subject, with reports of very excellent results from the surgical treatments he used.

Watts of the University of Virginia reported a successful case before the American Surgical Society in 1923, which had resisted all methods of dilatation. He finally did an operation which he calls "cardioplasty," somewhat like Finney's "pyloraplasty."

Heller, a German surgeon, in 1914 reported an extramucous cardioplasty, an operation in which he incised the esophagus, after turning up the costal margin through the constricted area down to the submucosa, over an extent of eight centimeters.

In 1923, Freeman of Denver, Colorado, reported a rather ingenious operation for a dilated esophagus which he did in 1902. He made an incision in the left cervical region, over the course of the esophagus, and located a very large dilated esophagus. At first he intended to excise it, but fearing a postoperative fistula he decided to invaginate it, and thereby shorten the elongated esophagus. He maintained the intussusception by means of a few chromic catgut sutures. This patient remained relieved after twenty years.

I attempted esophagogastrostomy nearly two years ago in desperation, to try and relieve an enormously dilated esophagus which I had been treating for about ten years. At that time I was not aware that this operation had been attempted by anyone, as I had not been able to find any literature indicating that it had. I spent considerable time and effort on the cadaver to locate the danger points in the operation, and to work out a method of securing as good exposure of the field as possible.

I found that a high midline vertical epigastric incision gives the best exposure, with a transverse incision at the lower end of the incision, if needed. In order to secure a good exposure of the diaphragm, it is necessary to excise the left lateral ligament of the liver which attaches the left lobe of the diaphragm. This procedure gives a good exposure of the diaphragm to the right of the esophagus. A transverse incision can then be made in the diaphragm to the right of the esophagus, extending almost to the latter.

After the satisfactory exposure of the field, an esophagoscope was passed to give a better view of the esphogaus, and this also enabled me to dissect it free, to obtain enough of the esophagus to pull through the diaphragm to anastomose it to the stomach. In the dissection of the dilated esophagus from the upper surface of the diaphragm I met with some difficulty, due to the dense adhesions between the upper surface of the diaphragm and the esophagus. The presences of the esophagoscope helped somewhat, as it enabled me to see the walls of the esophagus very distinctly. However, the adhesions were very dense, and as I was dissecting the patient's condition became very serious, necessitating the withdrawal of the esophagoscope.

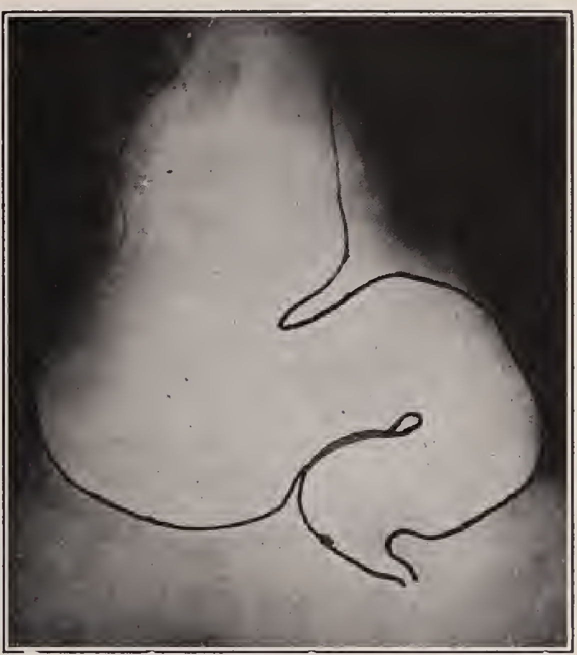

Fig. 2. Suggests anastomosis between stomach and dilated esophagus.

When his condition improved, I made a hasty incision in the stomach. By passing the index finger into the cardia, then the second finger and finally all four fingers, I succeeded in dilating the esophagus through the stomach. It was my intention to operate a second time at the end of about ten days or two weeks to make the anastomosis between the pouchy esophagus and stomach, but the patient was too weak, and he had a postoperative mental disturbance, so that another surgical interference did not seem warranted.

However, he was considerably benefited by the digital dilatation of the cardiospasm. I followed the case for about a year after the operation as I had hoped to have another opportunity to complete the operation (fig. 2).

I am convinced that such an esophagogastrostomy may also be successfully applied to diverticulum of the lower end of the esophagus, which heretofore has been considered as nonoperative. The only delicate point of consideration in these cases would be whether the wall of the diverticulum has sufficient blood supply to insure healing of the anastomosis. It seems to me, however, that we would be justified in attempting such an operation, as there is little other possible hope to secure permanent relief for such patients.

# EXPERIMENTAL TRANSPLANTATION OF URETER IN WHICH A TRANSFIXION SUTURE IS USED TO COMPLETE THE ANASTOMOSIS

Robert C. Coffey, M.D.
PORTLAND, ORE.

In my experimental surgery on ureteral transplantation I have noted that, if one of the sutures which fastens the ureter to the intestinal wall penetrates both the ureter and also the mucous membrane of the intestine, a fistula results. In clinical surgery, where the ureter has been ligated, the kidney apparently becomes normal again when the ureter opens, even after total obstruction for a week or more.

A surgical friend has reported to me a case in which he accidentally ligated both ureters which he did not discover at the time of operation. Noting that the patient had anuria combined with pain in the case, in about thirty-six hours he did double nephrostomy. After the catgut ligatures had been absorbed, both ureters reestablished their continuity and the kidneys became normal.

How to deal with a ureter which is known to be severed or destroyed during the progress of a serious abdominal operation is very puzzling to the surgeon. To open the intestine and do the submucous transplantation by the original or by the tube technic is a serious added burden to such a patient. With the foregoing observations as a background, I have devised the following simplified technic for the transplantation of a single ureter which has seemingly worked as well or better so far on dogs than any other which we have used.

The proximal end of the severed ureter held in

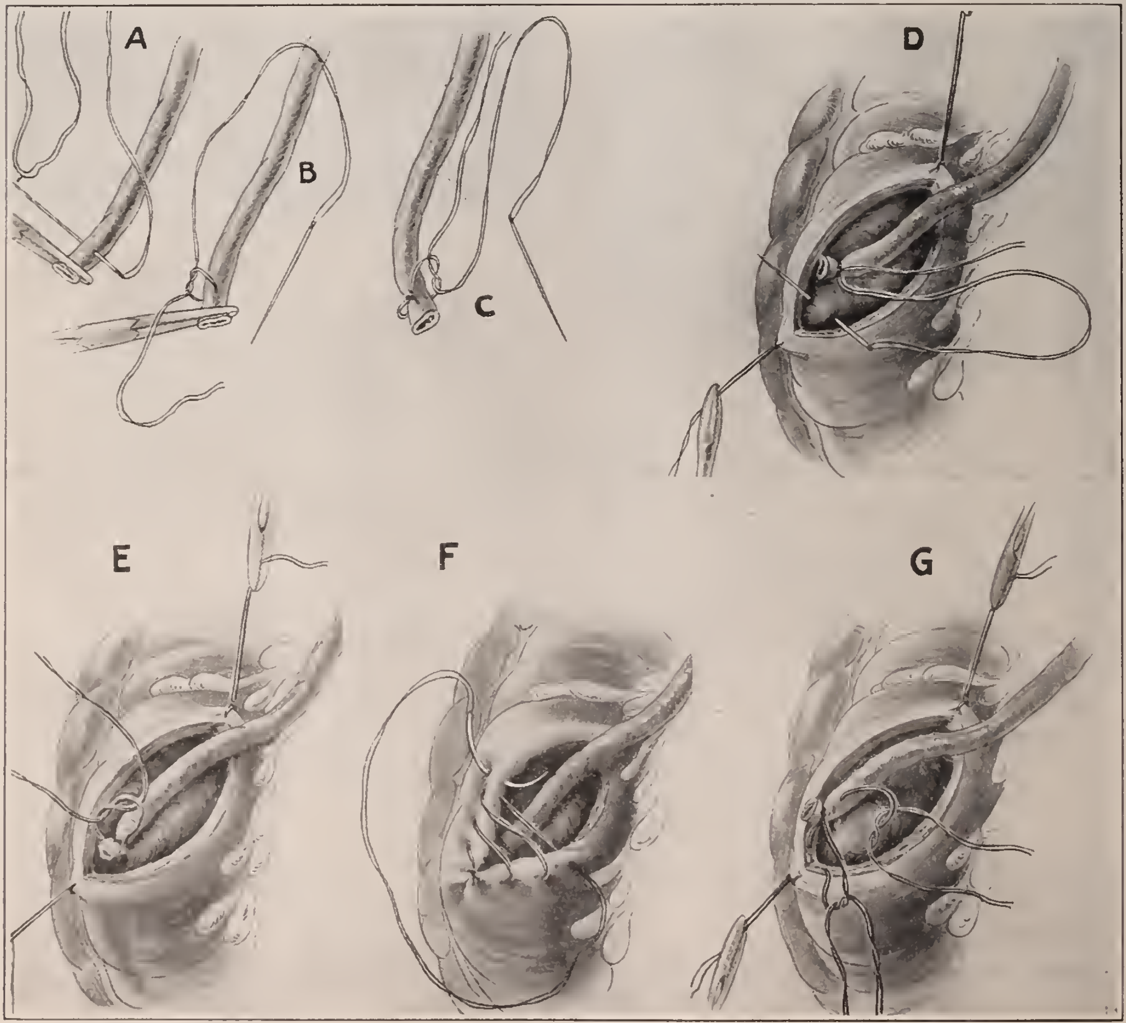

Fig. 1. Experimental transplantation of the ureter in which the anastomosis is completed gradually by a suture which transfixes both the ureteral wall and the intestinal mucosa and cuts an opening.

artery forceps is transfixed by a very fine straight needle, armed with very fine linen or silk, doubled so that the thread is almost as large as the hole made by needle (fig. 1-A). One half of the ureter is tied (B). The ends are then turned around and made to include the other half of the ureter (C). Next, the incision is made down to the mucosa as in all the types of technic for submucous transplantation. The mucosa is mobilized. This straight needle is then made to penetrate the mucous membrane in the lower angle of the wound and includes a good bite of the mucous membrane (D). The thread is made to surround the ureter and include a bite of mucous membrane in one suture (E). The muscular and peritoneal walls are then closed over the ureter in the usual manner by continuous chromic catgut suture, thus covering the ureter in its submucous position (F). It may be advisable to put an extra row of very fine silk or linen sutures outside of this row, as we have done. This cuts through and the urine begins to drain into the rectum in from twenty-four to forty-eight hours.

An alternative procedure, indicated in G, has worked just as well as the other. In this case the end of the ureter is transfixed and ligated with a continuous catgut. The catgut is used as an anchor stitch and fastens the end of the ureter into the lower angle of the wound. A second stitch of linen transfixes the ureter and the mucous membrane of the intestine, and when ligated cuts through in a little shorter time than the other procedure. After the placing of this transfixing suture, the continuous anchor catgut suture at the end is used to close over the intestinal wall, making a very simple procedure. I have a feeling that this is the better technic.

A question arises as to whether it is better to tie the transfixing suture sufficiently tight to cause it to cut through immediately or to leave it slack so it will remain longer to guide the urine into the intestine. Another idea is to touch the outer surface of the mucosa in the wound where the ureter is anchored with carbolic acid or other escharotic or even the cautery, to cause it to open more rapidly.

All these things are being tried on dogs. Each will be evaluated when the specimens have been removed. The results will be published in a later paper. In the meantime, this work must be considered in the light of an animal experiment only.

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# WHAT BASIC SCIENCE HAS ACCOMPLISHED *

W. B. Penney, M.D.
TACOMA, WASH.
President Washington Public Health League

When, after a six year struggle, the Public Health League in 1927 succeeded in its efforts to induce the legislature to enact into law our basic science bill, Washington was the third state in the Union to secure such legislation. At the present time six states have such a law, and the medical profession of numerous other states are attempting to pass similar legislation. Of the western states, Oregon, Idaho, Arizona and California have made unsuccessful efforts along this line.

Probably you are all familiar with the provisions of the basic science bill, but I do not believe many of you know to what extent this measure has accomplished the object sought, namely, the protection of the public against unqualified and uneducated healers. If the Public Health League had accomplished nothing more than the securing of this one law, the benefits from that alone would prove a full reward for all of the money paid for dues and all of the efforts expended by the physicians. But this is only one of the league's many accomplishments.

I shall draw a comparison between conditions prior to and following the passage of the basic science bill. Statistics from the Department of Licenses at Olympia show that in the two examinations held before the bill was enacted, only 27 per cent of the licensees were doctors of medicine. More chiropractors were admitted than physicians, practically as many sanipractors and almost as many osteopaths.

But since the law has become effective the percentage of physicians has been from 90 to 92 per cent of all licensees in every one of the six examinations held, not one sanipractor has passed the examining board, six chiropractors have been passed to their own board, and about sixteen osteopaths. Instead of hundreds (at the old ratio it would have amounted to about four hundred) of drugless practitioners having entered the state to practice, only about twenty-four have that privilege. And the number of doctors of medicine passed by the basic science examining board has increased greatly over the number who sought licenses before this legislation. In fact, applications from medical doc-

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* Read before the Fortieth Annual Meeting of Washington State Medical Association, Yakima, Wash., Aug. 29-31, 1929.

tors are more than double the number of former years.

We can draw two deductions from these figures: (1) that enough of the cultists do pass the basic science examinations to make it impossible for them to go to the legislature with the claim that the examinations cut them out entirely; and (2) that more doctors of medicine are attracted to this state than was the case when Washington was known as a haven for healers. At the present time we occupy a position which is the envy of our neighboring states. They realize that we have a fundamental and far-reaching statute that applies to all who seek a license to heal or treat the sick. Our law is serving as a model for other states, and it has been designated by Harry Eugene Kelly, of the Chicago bar, nationally famous medical attorney, as the best basic science law in force in its provisions for the personnel of the examining board. To quote from his article: "Washington probably has made the best provision for establishing the examination on a purely scientific basis, separate and apart from any dogma."

Our concern now must be to protect this law from any modification, revision or annulment. The law has been and will continue to be the object of attack by the cultists and their followers. Needless to say, no proposition is admitted by everybody to be basic. The cultists maintain and will continue to do so that the dogmas of their particular cult can be administered without knowledge of any of the subjects called basic. The chiropractor, for instance, denies that diagnosis or any of the basic sciences are necessary, and claims his particular manipulation is pertinent to every disease.

Thus there will be the same assault on the basic science law that has always been made by quacks on any law that seeks to maintain definite standards. The most active opponents of all, perhaps, are the proprietors of low-grade cult schools, who can no longer gather in armies of poorly educated artisans and workmen who seek some more profitable white-collar occupation. The basic science law has killed their goose that laid their golden eggs. During the last session of the legislature a vigorous effort was made to pass a bill that would have permitted these cultists to dodge the basic science examinations. We can depend upon just as strenuous an attempt to obtain exemption at the next session, and in fact, at every legislative session for years to come.

To those who have the welfare of the public in mind, and that includes all of us, there is ever present the necessity of not permitting our organization to lag. We must continue our campaign of education of the people and of the legislators. Upon the Public Health League devolves the duty of presenting the public's cause to our senators and representatives. Health protection can be accorded only by those who understand those problems. Truth must be enforced; it is not self-evident. Error propogated by money and a disregard for facts frequently overcomes truth for long periods of time. It is not enough to state our case, or to secure the enactment of the bill and then retire. We must continue our league to represent us in holding the ground that has been won. Else we will lose our hard earned gains, and the public will lose their protection.

I am glad to be able to state that the league is in a healthy condition, but there are still some physicians who are not giving it their support. Until the membership is 100 per cent strong, we cannot go to our legislators and claim that the league represents the total medical profession. It is our hope that we may be able further to increase the membership and reduce our dues during the coming year.

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Cause of Cataract and Nonoperative Treatment of Incipient "Senile" Cataract. John E. Weeks, New York (*Journal A.M.A.*, Feb. 8, 1930), asserts that except in the relatively few cases of occupational cataract, the development of spontaneous cataract is due to nutritional irregularities, such as a lack of a sufficient supply of acceptable pabulum or the presence of toxins in the pabulum supplied (as in diabetes, intestinal disturbances, and foci of infection), or to endocrinopathy. While it is not possible to restore degenerated lens tissue much can be done, particularly in the early stage of the development of the cataract, to arrest or to retard its development by improving systemic and local nutrition. In the endeavor to arrest or to retard the development of senile cataract, Weeks determined to supplement improvement in general health by improvement in local nutrition, if possible, by periodically increasing the flow of blood in the anterior tissues of the eye. A number of measures were tried; eventually a mixture of equal parts of a solution of boric acid, 3 per cent, and glycerin was selected. It was found that this mixture, when instilled into the eye, produced a sharp, smarting sensation, lasting about a minute, and an active hyperemia. Hyperemia always follows the instillation of this mixture; tolerance, such as follows repeated instillations of ethylmorphine hydrochloride, is not established; consequently it can be used indefinitely with the assurance of a uniform result. Patients were advised to instill the drops once daily, at night, in cases in which there was very little lens opacity; twice daily in more advanced cases. Although there is little danger of bacterial contamination, patients were advised to have the drops made fresh every month or six weeks. Treatment was discontinued only when arrest in the development of the cataract was assured. Patients were advised to report every six months or a year, or oftener if they thought necessary. All patients were notified of the presence of lenticular opacities (the term cataract was avoided when it was thought advisable) and thoroughly advised of the importance of the regular and persistent use of the drops.

# ORGANIZED MEDICINE

## ITS STATUS IN THE STATE OF WASHINGTON *

J. T. Rooks, A.M., M.D.
WALLA WALLA, WASH.

My object in making this study and presenting to you this subject is primarily to point out certain defects which exist in our state and county medical societies; and, secondly, to direct your attention to a policy, which I believe, if adopted and properly supported, would in a short time effect a better, stronger, more vigorous and more constructive organization. The progressive element of the medical profession is so engrossed in the study of scientific medicine that there is a tendency to overlook serious problems that are a menace to the welfare of the profession and that are of paramount importance to the health and happiness of our nation, problems that should be of vital concern to every physician in the land.

The value of organization, its influence and constructive power can never be questioned. Further comment on that phase of our problem would be superfluous, for since the social standing and general prestige of the average physician in any community is on a more lofty plane than that of the majority of his fellow citizens, the odds are in favor of the profession. But in order to be effective a medical organization must exist in fact as well as in name. In other words, it must function as a unit. When we come to analyze our own county and state societies, we find that a good active organization, with a membership bubbling with enthusiams, is so rare that I dare not attempt to single out one for discussion.

Several years ago a gentleman by the name of Frances W. Shepardson, an educator by profession, was appointed by the governor of Illinois as director of the State Department of Registration and Education. Mr. Shepardson attempted to revolutionize some of the legal aspects of the practice of medicine in that state. He was bitterly opposed, defeated and condemned by the state medical society, because in his attempt to arouse professional sentiment and muster to his side the support of the physicians, he assumed a pedagogic attitude and denounced the medical profession in no uncertain terms. As an example of one of his most scathing aspersions, I will quote the following: "A poorly organized profession with less than half its members associated with the state society and with no clearly outstanding champions ready to tilt their lances against the foes of medical honor." I wish to have it distinctly understood that I do not aim to utter a single word in support of Mr. Shepardson's regime, but we cannot overlook the fact that truth is as nauseous as the most potent emetic and as painful as the most malignant disease, when it exposes our failings and makes known our weaknesses, and this statement, malicious as it may sound, merely adds strength to that axiom.

I undertook this study with certain fairly definite and preconceived notions or theories, but my aim has been not only to present the facts in an unbiased manner but I have also endeavored to make my investigations thorough and my interpretations fair to all. Not being able to visit every county society in the state, I sent a questionnaire to each of the secretaries of the twenty county medical societies, of which the following is a copy.

"1. How many members in good standing have you in your county medical society?

"2. How often does your county medical society meet?

"3. What has been the average number of physicians in attendance at the regular meetings of your county medical society in the last year?

"4. Give the names of each of the cities, towns and villages in the county or district in which your society is located."

The response which this questionnaire brought forth is interesting and somewhat illuminating in certain respects but decidedly disappointing in many others. In reply to the question, "how often does your county society meet," one secretary answered tersely by saying "seldom," that his county society had held no meetings during the current year. Of the twenty secretaries to whom the questionnaire was directed only sixteen found it convenient to answer. Out of those sixteen the replies show that the average attendance at the regularly scheduled meetings varied from zero to 138 per cent, making a total average attendance for the entire state of about 57 per cent. It is to be noted, however, that the average attendance at the meetings of two of these county societies was 133 and 138 per cent respectively. This unusual record, of course, was due to the presence of visiting physicians.

If we omit these two societies and consider the other fourteen separately, we find the average attendance reduced to 47 per cent. Assuming that

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* Read before the Fortieth Annual Meeting of Washington State Medical Association, Yakima, Wash., Aug. 29-30, 1929.

this same average holds good for the other four, whose secretaries were too busy to reply or who for other reasons failed to do so, and making due allowances for visiting physicians, we readily see that the actual attendance of members is probably less than 40 per cent, and it may be even lower than that. This is not a commendable showing. Obviously interest in these meetings is lacking and enthusiasm is apparently unknown. Too many things are left for the officials to do and inertia on the part of the membership as a whole is too much in evidence.

There are 1838 licensed physicians in this state, 1350 of whom are members of the county and state societies, or about 73 per cent. Comparatively, I think that is not a bad showing, but it should be better. What is the matter with the other 27 per cent? I cannot imagine a single excuse for any decent respectable physician not affiliating himself with his county society. Is it possible that more than one out of every four licensed physicians in the state are not worthy of a membership in a county society? And the idea of an average attendance at the regular meetings of less than 50 per cent of the paid up membership is a disgrace.

No doubt some physicians are disappointed with the scientific programs or with the policies of the officials. Granting that there may be cases in which the meetings do not come up to one's expectations, yet in all such cases we have to admit that the burden of responsibility for these failures certainly rests upon the shoulders of the individual physician, especially those who realize the existence of such imperfections, and merely growl about them but offer nothing constructive to remedy the situation. In the sparsely settled communities, where it is necessary in some cases for a physician to travel a distance of fifty or more miles in order to attend a county society meeting, strange as it may seem, there is where we find the best average attendance. These doctors are to be commended for the interest they are showing in organized medicine, for the great effort they make and for the inconvenience they suffer in order to attend the regular meetings of the county societies. But men of that caliber are in the minority. The same interest is not so evident in the larger centers of population.

We would do well to strive to emulate the example of the service clubs, in which attendance is compulsory and enthusiasm is universal. There are too many so-called good ethical physicians who take no interest in medical organizations and who do not appreciate their value. The secretaries and other officers and the membership as a whole should make a greater effort to sell the spirit of the organization to these men and bring them into the fold. Even though we may think we have just cause for questioning a physician's moral integrity, yet in the absence of substantial evidence we can render him a greater service and may even turn his footsteps up the road to righteousness by encouraging him to join his county society and to take an active interest in its various functions.

The number of United States governmental free hospitals and free service is constantly increasing.[1] Paternalism, state medicine, governmental restrictions and regulations, and perhaps the tendency on the part of a minor element of the profession to commercialize the practice of medicine, free clinics and this or that free welfare movement, supported in some cases by great funds or foundations, and many other charities designed and maintained by well meaning, though misguided, well to do, otherwise idle people are staring us in the face at every turn. These insidious, socialistic movements are actually disemboweling our profession and offering suffering humanity that which we know in many cases to be impractical and for the most part dangerous to the public health and detrimental to the welfare of the nation. Without an active alert organization, we must stand idly by and even support these various movements which are the most deadly foes of the practice of medicine as we know it. In many cases our feeble attempts to fight vicious legislation and to mould public opinion are but little more than mockery when, as a matter of fact, there is no other social group whose influence could possibly approach that of a well organized medical profession.

Unless we awake and meet the situation in an effective manner, we must accept the inevitable and prepare ourselves as a profession for that fate which eventually overtakes all those who are afflicted with encephalitis lethargica. The secretary[2] of the American Medical Association sounded a timely warning when he said: "There has never been a time when there was greater need for compact and efficient organization of the physicians of this country than exists now. Our plan of organization is comprehensive and in most particulars entirely sufficient, if put into proper operation and carried out with reasonable efficiency." In my opinion the plan approaches the ideal.

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[1] West, Olin: Reports of the Secretary, J. A. M. A. 22:1839-1840. June 1, 1929.

[2] West, Olin: Loc. Cit.

# PROBLEMS OF THYROID DISEASE

## PREOPERATIVE AND POSTOPERATIVE CARE OF THYROID PATIENTS

Millard S. Rosenblatt, M.D.
PORTLAND, ORE.
Formerly Resident Surgeon, Harper Hospital, Detroit, Mich.

All toxic thyroid patients should be treated preoperatively by bed rest, high caloric and high fluid diet, compound solution of iodine (Lugol's solution) and sedatives. Digitalis should be occasionally used. The dosage of Lugol's solution is usually m.m. 5, t.i.d., p.c., but in the very toxic cases it may be m.m. 15, t.i.d., p.c.

It is used in adenomas as well as exophthalmic cases, as by Graham and Cutler and the Cleveland Clinic. This is given until the maximum effect to be expected occurs; this varies from four days to two weeks. In very toxic cases it should be given even the morning of the operation. For patients who have been on Lugol's solution for a long time and have passed the optimum benefit and retrogressed, it is best, unless only mildly toxic, to give a long rest from iodine therapy, and after a considerable period of time has elapsed its use should be again begun.

The type and amount of sedatives used varies with the degree of hyperactivity and unrest of the patient. Elix. sod. bromide, gr. 30 t.i.d., reinforced by gr. 5 or 10 of veronal or medinal h.s., is found very effective. To this may be added codein gr. 1 once or twice a day, if necessary, and in the very toxic cases morphine sulphate by hypodermic may be necessary to gain rest. Some clinics use digitalis preoperatively in all toxic cases, some proclaiming its use disadvantageous.

We use it only in cases where cardiac damage is already evident, and do not confine this to the presence of auricular fibrillation. If there is a serious cardiac dysfunction, the patient should be completely digitalized preoperatively and kept that way for a time after the operation. If cardiac dysfunction is not evident but is feared, partial digitalization may be done before the operation so that it may be more quickly effective later. The effect is not so much that of slowing the pulse, but rather of supporting and stimulating the cardiac muscle. Preoperatively digitora by mouth is used; postoperatively digifoline hypodermically is used, the dosage being figured in the usual way.

As to the judgment of the time for operation, the pulse rate and clinical impression of the stability of the patient should be used. If the basal metabolism rate agrees with these, it is even better. On the other hand, we attach the major importance to the first two, as the latter may be misleading. Toxic patients should be operated on early in the morning, and not be allowed to wait until noon.

Postoperatively the patients are given fluids freely, and urged to take them. A medium head rest is given. An ice bag to the head and two to the chest are applied. Morphine sulphate in doses proportionate to the patient's size is given hypodermically p.r.n., often enough to keep him quiet and drowsy, usually every three to four hours for the first two days, and longer when necessary. A Murphy drip of z. 10 of normal saline and m.m. 30 of Lugol's solution is given after the operation and every four hours. Normal saline is given by hypodermic in very toxic cases, 1000 c.c. and 100 c.c. every hour. Lugol's solution may be added to this instead of the Murphy drip, m.m. 30 to every 1000 c.c.

The morning following the operation Lugol's solution is given by mouth, m.m. 5 to 15, t.i.d., depending on the severity of the case. The Lugol is tapered off slowly and the cases are frequently discharged with orders to take m.m. 2 to m.m. 5 of Lugol's solution at home. Recently Else has advanced evidence to prove the need of this iodine therapy over the readjustment stage which occurs postoperatively. This evidence agrees with the clinical experience.

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# CANCER AND ENDOCRINES

H. H. Schwartz, M.D.
SEATTLE, WASH.

To date little more than nothing is known of the origin and cause of malignant tumors. With all of the research and fortunes that have been expended toward the solution we have learned a great deal about the classification, typing and characteristics of cancer but the only knowledge of any cause that we possess is a history replete with discarding one theory for another. Some of the classical theories have been: (1) That an arrested embryonic cell suddenly awakens in a finished structure and crazily goes to producing its own type; (2) that an adult cell reverts back to embryonic tissue cells, then multiplies as it would in utero; (3) that injury is responsible for a precipitating cause of cancer formation; (4) that chronic irritations, mechanical, chemical, x-ray, sun or traumatic can produce a malignancy; (5) that some infection either bacterial or protozoan directly or indirectly changes normal tissue to embryonal structure.

From various collaborators, i.e, pathologists, technicians, clinicians, surgeons, etc. we have amassed many facts. We know, for example, that cancer is principally an affliction of adults advanced in years and is seldom found in infants and children. Statistics show a prevalence in women greater than in men. Research in an effort to locate or identify a specific infection, bacterial or protozoan, as the cause for cancer has resulted in the general concession that none discernible can be blamed for the malady.

In Mallory's text on pathology, with reference to true tumors (neoplasms), is undoubtedly the simplest and most comprehensive classification which differentiates fifteen types of embryonal cells, each blast capable of producing its own type of tumor. When these cells invade they become malignant. He further states, as do all pathologists, that the cells of the three layers from which these blasts spring, the ectoderm, mesoderm or entoderm are also found to constitute malignancies. We know that these three types of cells give rise to tumor mass more malignant than any of the blasts springing from them because these cells are further removed from the adult cell. It follows, then, that tumor of morula type would be impossible to differentiate and be the most malignant growth. The prognosis made on these facts regarding any malignancy is quite reliable. From the foregoing data and facts one conclusion at least must be and is accepted, that a tumor is a parasitic mass, not foreign to host, composed of autogenous embryonal cells, and the further removed these cells are from adult cells the more malignant is the nature of the growth.

This fact brings us logicaly to a brief consideration of the embryo itself. Started by the union of a spermatozoon and an ovum we have the commencement of a mass of cells (a morula), and growing by mitosis it develops very rapidly. It differentiates into the ectoderm, mesoderm and entoderm, developing the chorionic villi which invade the muscles of the womb, where is established a hemangioma and through it derives its nourishment from the host, thus becoming a true parasite. In due time the ectoderm, mesoderm and entoderm differentiate into the fifteen blasts from which all our organs are completed.

Every embryo at the time of and shortly after conception is a seething, teeming mass of mixed cancer which as it grows loses its malignancy to complete (by differentiation of cells) a benign entity. Cancer, on the other hand, begins as a simple tumor and, compared to the embryo, is benign, but instead of differentiating the cells of subsequent offspring it continues of the same type.

Since a malignant tumor is nothing foreign to the host infested with it but something of which, in part at least, he or she was at one time composed of and, since a pregnant woman is also an individual supporting a malignant growth which cures itself, it might not be amiss to study these two hosts. The first is pregnant with a mixed cancer, the second with a simple one.

Generally speaking, pregnancy occurs in the precancerous age. The pregnant woman clinically presents an interesting metamorphosis. First, her womb, a decidual organ, no longer sheds its endometrium and menstruation ceases. Knowing that the ovaries control this function, we must acknowledge altered secretion from them. This is attested to in the slaughter houses by the finding of corpus luteum in pregnant cattle. Second, the mammary glands become obviously enlarged and a lactating function is prepared. Third, her thyroid gland becomes enlarged.

From the laboratory tests we learn there is present an increased metabolism rate and in the urine has been discovered secretions from the pituitary glands. That a pregnant woman becomes tolerant to this secretion and a nonpregnant woman is not is proven by the intradermal test of anterior pituitary. Three minims will produce a wheel or urticaria on the nonpregnant subject in from three to six hours, lasting from six hours to six days, but it will produce no reaction in a pregnant woman. The foregoing facts leave no doubt that the glands of internal secretion play an important role in pregnancy.

With reference to the patient with cancer, generally speaking, malignancies occur in advanced years in men and after menopause in women. The metabolism rate is low. The testicles and ovaries have atrophied or stopped functioning, the prostate gland in men is more of a nuisance than use. The thyroid, unless tumorous, is atrophied. Sclerotic changes frequently are evident in the arteries and all the organs. In other words, we have here a picture diametrically opposite to the former one.

Pregnancy has its seat in a young host, cancer in an old one. In pregnancy the glands are hyperactive, in cancer hypoactive. During the early part of an individual's existence tissues. develop and grow. During middle life tissues damaged or burned up are merely replaced but in later years they disintegrate.

During the span of a lifetime, from the cradle on, every individual is called upon to make constant adjustments to outside environments. These are climatic, economic, dietary, etc., yet last but not least in our consideration is our struggle against foreign invasion. We live in a sea of bacteria and protozoa; they are over us, under us, on us and in us. Metchnikoff's theory of our ability to combat these with phagocytes activated by opsonins and their specificity was classical and the experimental proof conclusive. Erlich's side-chain theory of immunity with precipitins, aglutins and lysins and their specificity accounted for the other infections successfully combated. Just how constantly these factors function can only be surmised, for not all invasions give rise to symptoms claiming our attention.

That the glands of internal secretions are taxed in the immunity mechanism cannot be doubted. All of us have seen those patients who successfully recovered from some acute infection and manifested endocrine dysfunction, such as hypothyroidism with obesity, low metabolism rates and many so-called functional ailments. It is not amazing, then, to find deficient endocrines after forty or more years of battle. The question might be put, "why don't we all die of cancer?" That same question might also be asked about any infection. The answer would be identical. No two individuals inherit exactly the same equipment with which to go through life. Ears differ as do eyes, proportions, nervous systems; in fact, everything, including the endocrines. Also no two individuals encounter exactly the same battles to fight.

Recently before a meeting of pathologists in California a case report was presented by Drs. Coffey and Humber. Cortical adrenals were employed for hypertension on a patient who was afflicted with inoperable cancer. To the surprise of the surgeons a change in the cancer became apparent; it diminished in size and now, after two years, is presumably cured. The question arises whether there is a scientific explanation for the apparent effect. That it is too early to draw any definite conclusion as to cure is unquestionable but the chance of finding a key to the cancer solution in the endocrines is far from impossible. The least that can be said for Drs. Coffey and Humber is that they have started new efforts in cancer research, have inspired new lines of thought with reference to a possible cause and have fanned many ambitions to renewed endeavors. There is not the slightest doubt in my mind that they succeeded in reducing in size or altering inoperable cancer, nor do I think it impossible that cancer can be cured. The faith I have in their reports and the endorsements by the members of the profession have led me to much speculation which in turn suggests numerous questions and explanations.

Assuming they have cured cancer with suprarenal gland cortex, the first question is, "Is this extract a specific for all types of cancer?" Taking into consideration the classified types of malignant tumors springing from the ectoderm, mesoderm and entoderm, plus the malignancies resembling embryonic structures antedating even these three layers (those which defy any efforts at differentiation or classification), the answer is not so simple.

If the answer shall be found, affirming cortical adrenal extract a specific for all malignancies, it must be explained in one of two ways. First, that cortical epinephrine secretion (and that secretion alone) controls the changes of all types of embryonic cells which produce a cancer. In embryo it would have to be accountable for altering the cells by steps into a benign mixed organism from an homologous cancerous mass. In adults it would be responsible for restraining all adult cells from reverting back to embryonal tissue or arresting embryonal tissue from reproducing. The cure could be explained on the basis that a dose excessive to the normal cortical adrenal secretion is fatal to all embryonic tissues. The second explanation (if cortical adrenal gland extract can cure all cancers) is that, though the secretion does not influence directly all types of embryonal and adult cells, its presence in the blood stream activates other glands of internal secretions which may bear directly on various types of cells.

The clinical research precipitated by the publicity given to the work so far will be tremendous and we shall not dwell long in darkness as to whether or not cortical epinephrine extract will cure all types of malignancies. In the event that the experiments will determine that this extract does cure cancer but only a certain type or types, and that certain other cancers are only partially affected or not at all, it will prove quite conclusively that specific hormones are required for certain types of cancerous cells. Here we must give thought to the embryo itself. The first organized structures we have coming from the blastocyst are the three layers of mesoderm, ectoderm and endoderm. They give rise to the differentiated blasts which make up an entire human being. Each layer is always responsible for the same structure, including all the glands. It follows that each layer produces certain organs or parts of an organ and certain glands of internal secretions.

It is not improbable that cancer cells are influenced by those glands of internal secretion which arise from the same layer of the blastoderm as the embryonic cell itself, nor would it be illogical to assume that all the endocrines of the same layer augment each other or are synergistic in action. Here, then, is a field for research that will solve the question of specific glandular extracts for specific cancerous masses.

All the recent work in no way diminishes or contradicts any of the findings on cancer that we already possess. In reality it starts from certain accepted facts, acknowledging that cancer cells are embryonic cells and leaving entrenched the two theories of the origin of tumors, namely: first, a cancer cell is an arrested embryonic cell suddenly awakened; and, second, a cancer cell is adult cell reverted to embryonic nature. It does revolutionize our reasoning concerning the cause, but since we have had no theory satisfactorily explaining a cause, we really have nothing to discard.

In the work on endocrines a most important accomplishment will be the furnishing to the profession tests to determine the exact status of all internal glandular secretions. The vast significance of such work is the potentiality of preventing cancer by balancing the hormones. In this direction we have gone a long step already with the metabolism test and the tolerance test of anterior pituitary. Along the same line we may some day be able to determine in the young what deficiency from the glands they are starting out in life with and thus by judicious therapeutics stabilize their secretory balance, preventing the acromegalics, cretins, etc., as well as equipping them better generally.

The internist, obstetrician or surgeon is familiar with the potency of hormones, such as pituitrin, ovarian, thyroid or adrenalin, so we must realize that to administer them or the glands for cancer without knowing the type of cancer cell with which we are dealing would be a shotgun treatment and disclose no scientific data of any value, if specific hormones shall be necessary. We know that dysfunction of one gland of internal secretion results in dysfunction of other glands. Rationalization of all the endocrines should be our aim. This field of endeavor must of necessity combine all fields of science and research with the handling of hormones. To arrive at physiologic information it will be necessary to determine the type of malignancy and the changes taking place in the mass, if any, through repeated sectioning.

This paper is presented with the hope that a new line of thought with reference to cancer may be stimulated and that an earnest endeavor by surgeons, clinicians, technicians and pathologists will be inspired. This line of procedure should be carried out by cooperative efforts and, whether the foregoing conclusions are proved or disproved, some valuable light will be shed on endocrines and their physiology. Any information we may glean regarding the endocrines will be a great reward for our efforts.

## CONCLUSIONS

1. A malignancy is a tumor mass not foreign to the host infested with it. Microscopically, a tumor cell is an embryonic structure, of which the host was at one time, in part at least, constructed.

2. Every embryo is a seething mass of mixed cancer which as it develops differentiates into adult cells to form a benign completion.

3. Cancer starts as a simple tumor more benign than the early embryonic structure but unable to mature into adult cells.

4. The embryo has its seat in a young host, where altered and hyperactive glandular secretions are manifested.

5. Cancer has its seat in an aged host, where altered hypoactive glandular secretions are manifested.

6. This gives us a new theory concerning cancer, namely:

a. That a pregnant woman's glands of internal secretion are activated by conception and the functions of her glands influence the destiny of the embryo which is a malignancy from the start.

b. That cancer occurs in a host, whose glands are not sufficiently activated to alter the embryonic nature of the growth.

7. The endocrines, which are so active in pregnancy and inactive in cancer, which is also a type of pregnancy, may hold the key to the solution for malignancy.

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# EDITORIAL

## THE SAN FRANCISCO CANCER CURE

Periodically appears a new cancer cure, usually exploited through liberal newspaper publicity, which is seized with avidity by victims of incurable cancer. Each has had its day, hailed enthusiastically by sections of the public, with more or less enrichment of the coffers of certain members of the medical profession, and in due time has sunk into oblivion. The latest discovery by Coffey and Humber of San Francisco has thus far followed true to form in the steps of its predecessors. Cautiously announced some months ago in the daily press, certain physicians hastened to the source of information in order to get in on the ground floor in the administration of the latest cancer remedy. When it was formally presented before the recent meeting of Pacific Coast Surgical Association, reporters of the Hearst press were let in on the good news who duly proclaimed a scoop on their newspaper brethren. At once the lid was off. The newspapers of this group devoted whole pages to exploiting the great discovery with all its details, including photographs of its sponsors in action. The traditional reticence of medical scientific investigators was repudiated and, demonstrating their truly benevolent interest in suffering mankind, these papers declared that the army of cancer sufferers were entitled to information concerning this treatment, and post haste they were going to get it, willy nilly, so far as the medical profession was concerned. Confirmation of belief in the new discovery was not wanting. Medical scientists from the cities of the Northwest and elsewhere climbed onto the band wagon and began to beat the drums. Accompanied by more photographs, they extended congratulations on the prospective benefits to be derived from the new cure, hoping that it would eventuate in the relief of afflicted humanity. It is true that next day the discoverers and their coadjutors proceeded to back water and implored the public to restrain their enthusiasm, since thus far the whole affair was only in an experimental stage. Yet this was immediately followed by newspaper announcements that clinics for the dissemination of the new treatment were to be established at Sacramento, Portland and other cities, and by train, automobile and airplane began the hegira to the San Francisco mecca. Shades of Glover, Koch, colloidal gold and lead, et al! What a nauseating spectacle to the eyes of all seekers after truth, believers in scientific research and accuracy!

There may be value in the theoretical speculation which has been offered to account for the disappearance of certain supposed malignant growths, coincident with the administration of extract of suprarenal cortex for the relief of hypertension. Yet one must remember that similar subsidence of alleged malignancies has been the basis on which has been proclaimed the efficacy of all recent cancer cures which have had their day and are now forgotten. It is not intended to intimate that this latest "cure" is necessarily a delusion or a bald assumption. From investigations suggested along this line of treatment may result something that will help to discover the cause of cancer. Yet the noisy publicity which has accompanied the launching of this treatment is one of the most regrettable in the recent history of medicine. The many exploitations of victims of incurable cancer in the past have served to discredit scientific efforts for the solution of the cancer problem.

Rarely has a true scientific discovery in medicine or other field of endeavor been attained by chance, as has been announced in this case. The great medical facts which have revolutionized the practice of medicine have been reached through long, patient labors and experiments on the part of many faithful workers. Not until data have been assembled to verify theoretical assumptions have these discoveries been proclaimed to the world and become established features in the practice of scientific medicine. While the whole hearted acceptance of this alleged cancer cure on the part of the general public is to be expected, the hesitation of the medical profession as a whole naturally follows their observations and experiences with so many cancer cures that have come and gone during recent years. All practitioners are awaiting the verification of claims either expressed or implied concerning the efficacy of this latest cancer remedy.

## THE OSTEOPATH AS HEALTH OFFICER

When the city council of Ellensburg a year ago appointed as health officer Walker, an osteopath, the incumbent physician, Dean, refused to retire and turn over the office to the new appointee. This was in accordance with instructions from the Washington State Board of Health, on the grounds that an osteopath is not a "legally qualified physician," who alone can be appointed a health officer according to the regulations of the board. This provision in the regulations follows the wording of the Constitution which provides for the establishment of a board of health. When the statute of 1907 was passed, requiring that health officers must be legally qualified physicians, osteopathy was not recognized in the state and no one claimed that an osteopath could meet the necessary qualifications. The statutes of 1909 and 1919, which provided for licensing osteopaths, designated them as "osteopathic physicians" and "osteopathic surgeons," granting them the privileges of giving anesthetics but denying the use of drugs and medicines in practice.

In April, 1929, Walker appealed to the superior court in Kittitas county which confirmed the action of the state board of health in refusing his appointment as health officer. Later he appealed from this decision to the State Supreme Court. The case was heard by five of the nine members of the court, and on February 3 of this year an opinion was rendered by Judge Walter B. Beals with the concurrence of the other four, reversing the action of the superior court. The argument was wholly on the ground that the term physician had of late years been broadened to include the osteopath, who is thus recognized as a physician in the same classification as a doctor of medicine as regards appointment to official positions in the state. The limitations provided by statute of the osteopathic physician and osteopathic surgeon appear to have been overruled and the denial of his use of drugs and medicines seems to have been disregarded. If this interpretation is followed, why should not the chiropractor, the various forms of drugless healers, the midwife as well as other forms of practitioners also be classed as physicians? This decision has established a principle of vital interest not only to the medical profession but to all residents of the state.

This ruling, if maintained, affects not only the treatment of the sick but it becomes a public health measure of extreme importance. This aspect of the question has been presented to the Supreme Court by the state board of health with the request that the whole matter be reconsidered. In rendering its decision the members of the court based their conclusions solely on the interpretation of the statute requiring the health officer to be a legally qualified physician. Whether or not the osteopath is enabled by his education and training to fulfill the duties of a health officer apparently was not under consideration. According to the announced principles of osteopathy and the teachings of its schools, they do not employ drugs and medicines in the treatment of disease. An important function of the health officer is outlining the treatment of venereal disease, requiring the administration of certain drugs. The treatment and prevention of contagious diseases necessitates the use of specific treatment for each, as the administration of antitoxin for the control of diphtheria and the toxin-antitoxin for its prophylaxis, vaccination for the prevention of smallpox and the administration of drugs for other similar diseases. How can an osteopath as health officer direct the treatment and prophylaxis for diseases by methods which are denied to him in practice and with which he has had no experience? The situation amounts to a manifest absurdity. If he were to attempt to function as a health officer, he would be liable to prosecution as a law-breaker for failure to carry out the requirements provided by health regulations in dealing with contagious diseases. Considering all aspects of this matter, one cannot avoid the conclusion that the supreme court decision has been unwisely adopted. It is believed that this may be reconsidered and arguments may be entertained in accordance with these facts.

## PURIFICATION OF POLLUTED WATER

The knowledge that polluted streams become purified by nature is age-old information. It has long been stated that running water purifies itself, the explanation often being the exposure to air and sunshine which have been supposed to act in some mysterious manner to eliminate the pollution. The United States Public Health Service has made a study of this subject and is publishing reports on experimental studies of natural purification in running water. It has been found that pollution from sewage and nonpoisonous industrial wastes when put in water is immediately attacked by myriads of bacteria which find polluted material satisfactory food, on which they increase rapidly in numbers. During this process dissolved oxygen is utilized and the pollution is changed into harmless bacteria and by-products. It was found that bacteria unassisted could not completely purify polluted water. Multiplying in the polluted water until a certain maximum number is reached, multiplication ceases as well as the process of purification, although pollution may still persist. If the number of bacteria is reduced their increase and the purification process continue. Nature has provided for a continuous bacterial reduction through the presence of certain protozoa, whose principal food is found in bacteria. These bacteria-consumers constantly feed on the bacteria, thus preventing the latter from reaching a limitless number. As the purification process approaches completion, both bacteria and protozoa decrease in number as the amount of food available for each becomes less. The addition of a poisonous substance to the polluted water may suspend or completely stop nature's purification process by destroying both of these agencies that work so industriously. This is an example of one of nature's methods of providing for preservation of man's life and continued health, of which the mass of mankind is blissfully ignorant.

## AMERICAN COLLEGE OF PHYSICIANS MEETING

The American College of Physicians held its Annual Clinical Session in Minneapolis, February 10 to 14. While for geographical reasons the session was smaller in attendance than would have been the case with a meeting on the Atlantic seaboard, it was one of the most successful on record. The outstanding features on the scientific program and the clinics were the symposium on the biology of cancer with papers; also a classic biology with discussions by Leo Leob, H. Gideon Wells of Chicago, Aldred Scott Warthin of Ann Arbor, Francis Carter Wood; and the symposium on surgery of tuberculosis by James Burns Amberson of Loomis, New York; Ralph Matson of Portland, Oregon; John Alexander of Ann Arbor; Phillip King Brown of San Francisco; and Gerald Webb of Colorado Springs. The special clinics and demonstration of the University farm were all notable features. An innovation was the evening session, devoted to papers detailing the history of medicine.

There were one hundred and ninety physicians who appeared on the program and clinics. They came from all parts of the United States and represented leaders in their particular lines. There is probably no condensed postgraduate week of such importance and worth anywhere in the United States as the annual clinic session of this college. There was a total registration of 1388. There were fifteen Fellows in attendance from Washington and five from Oregon. At this session 201 Fellows were inducted into fellowship and 67 Associates were elected. The total membership of the College is now 2360, of whom 1806 are Fellows and 554 are Associates. There was a large exhibit, with fifty-seven exhibitors and seventy-five booths. The next meeting of the College will be in Baltimore.

Following the meeting of the College in Minneapolis, a special program was arranged by the Mayo Clinic. Two special trains carried a large number of the members from Minneapolis to Rochester Friday night, February 14. An interesting program of papers and clinics was put on at St. Mary's Hospital. The newly elected officers are: President, Sydney Miller of Baltimore; president-elect, S. Marx White of Minneapolis; W. Blair Stewart of Atlantic City was elected chairman of the House of Governors.

## PACIFIC COAST SURGICAL MEETING

The fifth annual meeting of Pacific Coast Surgical Association was held at the Hotel Del Monte, Del Monte, California, Friday and Saturday, February 7 and 8. On the two previous days clinics were held in San Francisco. The members of the Association from the University of California presented an operative clinic and demonstrations on Wednesday morning at the University Hospital. The Stanford members on Thursday morning held their clinic at the San Francisco County and City Hospital. Later Dr. Coffey presented a clinic at the Southern Pacific Hospital, where his treatment for cancer was demonstrated.

At the meeting in Del Monte papers were presented by the various members, covering many fields of surgery, particularly of the lung, kidney and cancer. Drs. Coffey and Humber made the second official report of their treatment for cancer on Saturday morning. Their presentation was received with the utmost respect by their fellow members. The facilities of the Cancer Research Institute at Pasadena were offered to them through Dr. Charles Lockwood, while those of the Cottage Hospital Institute at Santa Barbara were extended through Dr. Rexwald Brown. In closing the discussion on cancer Dr. Emmet Rixford of San Francisco stated it was a matter of such tremendous importance that the members of the Association did not feel justified in discussing at this time the merits of the treatment. At a later meeting Dr. Coffey will present more detailed reports of his work. The Association did not endorse the treatment, as stated in the public press.

The following officers were elected for the coming year: President, J. Tate Mason, Seattle; first vice-president, Eugene Rockey, Portland; secretary-treasurer, Edgar L. Gilcreest, San Francisco; member of the Council, one year term, Wallace I. Terry, San Francisco, retiring President; member of the Council, four year term, George W. Swift, Seattle.

Members from the Northwest attending the Association were W. D. Kirkpatrick, Bellingham; S. L. Caldbick, Everett; H. D. Dudley, A. O. Loe, O. F. Lamson, G. W. Swift, P. W. Willis, Seattle; A. A. Mathews, Spokane; Eugene Rockey, J. E. Else, R. C. Coffey, R. B. Dillehunt, R. E. Watkins, Portland. Invited guests were B. T. King, R. J. McCurdy, C. F. Eikenbary, D. A. Houston, W. C. Speidel, A. L. Balle, Seattle; J. C. Coffey, Portland.

Brien T. King and Conrad Jacobson of Seattle were elected to membership. The next meeting will be held in Seattle.

## MEETING OF AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The Pacific Northwest is one of the well recognized goiter-favoring regions of the United States, and with this thought in mind, at the last meeting of the American Association for the Study of Goiter, Seattle was chosen for its 1930 meeting place and its seventh annual convention, July 10-12. The organization was founded seven years ago at Bloomington, Ill., for the purpose of creatig a society devoted entirely to the study of goiter and its kindred ailments. It has brought together each year men of outstanding ability, who have been working tirelessly on this not too well understood malady. This year is the first opportunity for the Pacific Northwest to have this association meet in its midst. Thus physicians of this section will be able to attend these meetings, which will be presided over by the most prominent goiter authorities of the country. It will indeed be a treat for the medical men of the Northwest and a large attendance will be anticipated. Details of the meeting will be presented in future issues of this journal

## MEDICAL NOTES

Manufacturers Consolidate. The old and well known drug firms of H. K. Mulford Co. and Sharp & Dohme have consolidated, the former having absorbed the latter. Also the long known X-Ray Corporation will no longer be known as such, it having given place to General Electric X-Ray Corporation (page 2).

### OREGON

Report of Health Survey Published. The final report of the survey of public health conditions in Portland, which was conducted recently by the American Public Health Association through its representative, Dr. James W. Wallace, has been submitted to the city council and the board of county commissioners. Three previous reports have been published.

The outstanding recommendation is a plan for elimination of the present dual system of city and county public health units, and the substitution of a single unit under the direction of a city and county health officer and an advisory board representing the county commissioners, the city council and the medical profession. The suggestion is also made that the work of the county physician be divided, in order that a full time physician may be secured for the direction of the Multnomah county hospital. The report also recommends that the present nonfunctioning board of public health be reformed and the public health federation be established to promote general interest in community health. An earlier report of the health survey committee called attention to the need for adequate care of tuberculous patients in the city of Portland and urged repeal of an old ordinance which prohibits the establishment of tuberculosis sanitoriums within the city limits.

Oregon Physician Impersonated. A man arrested recently in Oakland, Calif., for practicing without a license and giving the name of "Dr. Arthur C. McCown," is believed to have impersonated the Dr. Arthur C. McCown of St. Helens. The St. Helens physician stated that at the time he was practicing in North Portland, in 1928, his office was robbed of his state license to practice as well as his narcotic permit blanks. It is his belief that the Oakland imposter is the one who robbed his office and that at the time he may be in possession of his license.

Death Rate Lowered. The annual report on mortality statistics for Portland, recently announced by Gordon Lang, chief clerk of the health bureau, discloses the number of deaths per 1000 of population to be 10.7 as compared with 10.9 in 1928. The incidence of diphtheria among children was also decreased, following an active campaign for toxin-antitoxin immunization carried on during the past year.

Death Certificate Form Protested. As a result of the voicing of dissatisfaction on the part of several county coroners and district attorneys of Oregon, with respect to the new form of death certificate adopted by the state board of health, a meeting was held Feb. 5 in the office of District Attorney Stanley Myers at Portland to consider the matter. It was the contention of those present that the new certificate abolishes the necessity for physicians to report violent deaths to the local coroner. Dr. F. D. Stricker, secretary of the state board of health, explained that a state law makes it compulsory for doctors to report violent deaths and that the new form of certificate is in accordance with those already adopted in several other states. A committee was appointed to confer with Dr. Stricker in regard to changing the certificate.

Hermiston Hospital Opened. The Waterman home at Hermiston, which has been remodeled for general hospital purposes, was opened to the public Feb. 6. Dr. A. W. Christopherson is in charge.

County Hospital Planned. Dissatisfaction with the rising cost of care of indigent patients at Eugene has led to a movement for the establishment of a county hospital in that city. Judge C. P. Barnard is among those who are interested in the plan, which will probably be submitted to the people at an early general election. The former Mercy hospital property has been suggested for the purpose.

The Portland Academy of Eye and Ear Specialists held its annual dinner and meeting at the Arlington Club, Jan. 22. Dr. Will Otto Bell, Seattle ophthalmologist, was the guest of honor and related his impressions of the International Eye Congress, held at Amsterdam, Holland, last summer. Election of officers of the Academy for the ensuing year resulted as follows: President, Dr. J. W. McCollom; vice-president, Dr. H. R. Lucas; secretaytreasurer, Dr. A. J. Browning.

Credit Rating Plan a Success. A credit rating and collection system for physicians and dentists, which was introduced in Portland a year ago by Mr. Clyde C. Foley, executive secretary of the Oregon medical society, has proved so satisfactory that branches are to be established in other cities of Oregon. The system is known as the "Oregon Plan" and has been widely copied in other sections of the United States.

Portland Academy of Medicine entertained Dr. William Osborne, professor of physiology at the University of Melbourne, Australia, at a dinner and meeting Feb. 2. The subject of his address was "The Contributions of Engineering to Modern Medicine."

Air Pilot Examiners Announced. The aeronautics division of the United States Department of Commerce recently announced the appointment of the following Oregon physicians as medical examiners of prospective air pilots: Portland, Drs. William House, D. C. Burkes, R. A. Fenton and I. B. Lupton; Corvallis, Dr. H. M. Francis; Eugene, Drs. G. C. Dyott and C. W. Robbins; La Grande, Dr. F. L. Ralston; Bedford, Drs. J. J. Emmons and J. C. Hayes; Salem, Drs. W. C. Smith and R. L. Wood.

Oral Surgeon Entertained. Dr. Boyd Gardner, chief oral surgeon at the Mayo Clinic, Rochester, Minn., was the principal speaker at the regular luncheon meeting of the Portland Rotary Club Feb. 11. His subject was "The Effect of Oral Infection on the Health."

Physician Candidate for State Senatorship. Dr. J. C. Booth, Lebanon physician, recently announced that he will enter the Republican primary as a candidate for the office of joint senator for Linn and Lane counties.

Clatsop County Medical Society held its annual election of officers at a meeting at the Columbia hospital in Astoria, Jan. 22. Dr. F. E. Fowler was chosen president, Dr. L. M. Spaulding, vice-president and Dr. E. J. Jasper, secretary-treasurer.

Central Willamette Valley Medical Society held its regular monthly meeting at the Hotel Benton in Corvallis Feb. 6. Drs. G. C. Bellinger and Phil Mewmeyer of the Oregon Tuberculosis hospital, Salem, were guests of the society and spoke on tuberculosis.

St. Mary's Hospital at Astoria held a staff meeting Feb. 12, at which an address on the subject of rectal diseases was made by Dr. Walter W. Black of Portland.

Dr. Edward Durno, formerly football coach of the high school at Medford, has returned to that city where he has entered upon the practice of medicine.

Dr. R. W. Kullberg has located for practice at Astoria.

## WASHINGTON

Contract Practice. Last month about two hundred and fifty Seattle physicians with men from adjacent cities met in special session to consider the perennial bugbear of contract practice. It was reagitated at this time partly as a result of the Bridge clinic of Tacoma establishing a branch in Seattle and proceeding to corral all available contracts that would include as many citizens of that city as possible, at as low a fee as the traffic could stand. Thus the union of street car men was said to be taken on at seventy-five cents per member for the month. The neglect of certain Eagle contract doctors to care properly for the army of members under their official care came in for proper scoring. Also Seattle clinics and individuals who thus avariciously absorb practice from the fields of other practitioners at cut-throat figures received suitable consideration. Dr. H. J. Davidson led the attack by exposure of the loose and deficient methods of treatment inherent in contract practice, thus making this a problem of interest not only to the medical profession but to the general public who fail to receive their money's worth from this sort of medical attention. It was stated that reliable legal opinion holds that a contractee who fails to receive adequate services from a medical contractor can employ another physician, whose bill can be collected from the contractor. Resolutions bearing on the matters under discussion were passed, requesting officials of King County Medical Society to conduct further investigations leading to action that will soon be referred to the membership.

Hospital at Kirkland. Work is now under way on the construction of a modern two story hospital at Kirkland. There will be accommodations for ten patients. The new structure will be the culmination of years of effort on the part of Dr. George H. Davis, veteran Kirkland physician, and interested citizens to provide that community with modern hospital facilities.

Hospital Remodeled. Extensive changes, amounting to a cost of $15,000, are being carried out at St. Elizabeth's hospital, Yakima.

**Doctor Endows Hospital Bed.** Provisions for the endowment of a bed at the Children's Orthopedic hospital, Seattle, was made in the will of the late Dr. R. C. Baumgarten, Seattle roentgenologist who died Feb. 3. He had occupied the position of attending roentgenologist at the hospital for the past two years.

**Longview Memorial Hospital** held a clinical staff meeting in Longview Feb. 5, at which addresses on neurologic subjects were made by Dr. D. G. Dickerson of Seattle and Dr. A. C. Stewart of Tacoma.

**Doctor's Son Succumbs Abroad.** Sympathy is being extended by both professional and lay friends of Dr. and Mrs. John Wotherspoon of Seattle, whose son Kenneth died at Glasgow Jan. 24, where he was enrolled as a medical student at the University of Glasgow.

**Bridge Party Held.** Two hundred and forty physicians, their wives and guests attended a bridge party held by the King County Medical Society at the Olympic hotel, Seattle, last month. At the conclusion of the evening a supper was served and valuable prizes, donated by local merchants, were awarded by lottery to the guests.

**Elected to American College of Physicians.** Dr. D. H. Nickson, pathologist at Swedish hospital, Seattle, and Dr. C. E. Watts, Seattle internist, were elected to membership in the American College of Physicians at a meeting of that organization held last month at Minneapolis, Minn.

**Elected President.** Dr. J. Tate Mason of Seattle was elected president of the Pacific Coast Surgical Association at the annual meeting held last month at Del Monte, Calif. The next convention will take place in Victoria, B. C.

**Dr. Fred R. Hedges** of Everett, who has been seriously ill, has gone to the home of his brother in Oregon City, Ore., to recuperate.

**Dr. Harold D. Lyman**, of the Marine hospital at Port Townsend, has been transferred to the San Francisco Marine hospital.

**Dr. Robert W. Rose**, a graduate of Creighton University Medical School, has returned to Spokane, his native city, to practice.

**Dr. Tom Christmas** of the medical staff at Fort Lewis, has been transferred to the Panama Canal Zone.

**Wedding.** Dr. Ernest B. Parmelee, a member of the resident staff at St. Luke's hospital, Spokane, and Miss Evelyn Lindley of Milwaukee, Wis., were married at the Holy Trinity church in Spokane, Feb. 12.

## IDAHO

**Medical Building Opened.** The Sturgis Medical building at Coeur d'Alene, a modern, two story brick structure, was opened for inspection by the public Feb. 1. It was erected by Dr. H. J. Sturgis for office and hospital purposes.

**Dr. C. F. Magee** of Moscow received painful injuries of the abdomen Jan. 19 when he fell from a window sill in his office.

**Dr. H. R. Bankard** of Harrison has sold his practice to Dr. H. W. Shyrock, and has moved to Klickitat, Wash., where he will engage in practice.

## OBITUARIES

**Dr. Roy Chester Baumgarten**, prominent roentgenologist of Seattle, Wash., died at Providence hospital in that city Feb. 3 from complications following an operation, aged 41 years. He was born in Davenport, Iowa, in 1889, and graduated from Jefferson Medical College, Philadelphia, Pa., in 1912. Following an internship at the Seattle City Hospital he became associated in practice in that city with Dr. Harry A. Shaw until the outbreak of the World War. He then entered the medical service of the army and became medical officer in charge of the roentgen service of the hospital at Camp Travis, Tex. At the close of the war he returned to Seattle, where he built up a large practice in roentgenology. He was also roentgenologist to the Children's Orthopedic hospital and was active in the affairs of the American Legion. Due to his attractive personality and professional attainments his death is a great loss to the medical profession as well as the general public.

**Dr. Sarah A. Kendall**, a pioneer woman physician of Washington, died at her home in Seattle Feb. 6, following a brief illness, aged 79 years. She was born in Bath, Me., in 1851, and graduated from the General Medical College, Chicago, Ill., in 1888. She located in 1884 in Seattle and practiced continuously there until her retirement ten years ago. Throughout her life she was active in civic and club affairs in her community, and was one of the pioneers in the woman's suffrage movement.

**Dr. Harry Bulkely Clough**, Vancouver, Wash., died at the United States Veterans' hospital at Portland, Ore., Jan. 14, aged 65 years. He was born in Washington, Vermont, in 1864, and graduated from Louisville Medical College, Louisville, Ky., in 1897. He came West in 1891 and practiced in several western cities, including Sultan, Wash., Newberg and Damascus, Ore. In recent years he had made his home at Vancouver.

**Dr. George A. Gray**, a practicing physician in Spokane, Wash., since 1898, died in Queens hospital, Honolulu, T. H., Feb. 2, following a prolonged illness, aged 61 years. He was born in 1869, and graduated from the University of Minnesota Medical School, Minneapolis, Minn., in 1898. He was an officer in the army medical corps during the World War.

**Dr. William Reese**, retired physician of Portland, Ore., died at St. Vincents' hospital in that city Feb. 11, from injuries sustained the day before, when his automobile collided with a street car. He was born in 1860, and graduated from the Medical College of Indiana, Indianapolis, Ind., in 1890. He practiced in Illinois for many years and in 1916 moved to Portland, where he was active until a year ago, when he retired and moved to Nelscott.

**Dr. Lewis F. Bennett**, who practiced for several years in Spokane, Wash., died at his home in Beloit, Wis., Jan. 26, aged 70 years. He was born in 1860, and graduated from Rush Medical College, Chicago, Ill., in 1886.

# REPORTS OF SOCIETY MEETINGS

## OREGON

### POLK-YAMHILL-MARION MEDICAL SOCIETY

Pres., G. C. Knott; Secty., W. W. Baum

The regular meeting of the Polk-Yamhill-Marion Medical Society was held February 4 at the Elks Club, Salem. The program was as follows:

"Gastroenterostomy: The Study of Wound Healing Following Various Types of Suture Methods." Dr. Karl H. Martzloff of Portland. Discussion by Dr. C. H. Robertson of Salem.

"Amebiasis in the Northwest." Dr. H. G. Hummel of Salem. Discussion by Dr. A. B. Starbuck of Dallas.

Dr. G. B. Smith of Woodburn reported a case of lethargic encephalitis.

Mr. Clyde C. Foley, Executive Secretary of the State Medical Society, presented to the Society a plan of local organization for a health educational center and centralized cooperative business office for the medical and dental professions.

## WASHINGTON

### KING COUNTY MEDICAL SOCIETY

Pres., D. H. Houston; Secty., A. J. Bowles

A general meeting of King County Medical Society was held in the auditorium of the Medical-Dental Building, Seattle, Feb. 3, with Dr. A. H. Peacock in the chair. About one hundred and fifty members were present. Minutes of the meeting of Jan. 6 were read and approved.

Dr. Harry C. Olmsted read a paper "Impetigo Contagiosa Neonatorum. A Present Day Hospital Nursery Problem." The common source of initial infection in the new-born is a physician, nurse or mother suffering pyogenic infection in some form. Other infants become infected through nurses' hands, furniture and equipment. Mild cases heal spontaneously in a few days. There is always danger of developing an acute exfoliating dermatitis, whose death rate is high. The writer stressed the importance of prophylaxis. In treatment of individual cases it is important to avoid overheated and moist conditions of the skin. Exposure of the naked body to the air, ultraviolet or direct sunshine is favorable to rapid relief. Drs. H. L. Moon and Norman Clein discussed the paper.

Dr. Laurence Selling of Portland read a paper, "Some Recent Aspects of Motility Disorders." Formerly nearly all such disorders were classed as neuroses. Now they are known to be organic diseases with localization of the essential pathologic processes in the basal ganglia. Many symptoms resemble those associated with the psychoneuroses. There was a discussion between the motility disorders and the vegetative nervous system. The paper was discussed by Drs. C. J. Rohwer, G. E. Price and B. S. Paschall.

Dr. A. H. Peacock announced the recent illness and death of Dr. Roy C. Baumgarten.

Dr. Lester J. Palmer explained the plans of the Program Committee for the remainder of the year.

The chairman reported that Dr. George W. Swift had been appointed chairman of a committee to investigate contract practice, the committee soon making a report before a special meeting of the members.

A recent ordinance regarding the storage of roentgen films was presented, together with a report of the committee.

Dr. C. E. Smith presented a film from Petrolagar Laboratories, Inc., displaying the mobility of stomach and bowels under the action of different drugs.

Applications for membership were presented from Drs. W. W. Collins and T. T. Dawson.

The medical section of the society held a meeting February 10, with Dr. Frederick Slyfield in the chair.

Dr. A. L. Jacobson presented a case of allergic migraine which had existed about six years with attacks every three weeks for a day or two. Allergic tests showed the patient sensitive to halibut and other fish foods, whose elimination has abolished the attacks for the past ten months. The speaker believed that all cases of migraine may be of true allergic origin.

Dr. D. G. Dickerson discussed "Intracranial Tumors Arising from the Meninges," illustrated with lantern slides. These tumors tend to grow in certain sites, usually in the region of the large dural venous sinus in frontal regions of the cerebrum. They are most common after the fifth decade of life and constitute about 12 per cent of all intracranial tumors. Some present Jacksonian convulsions, while others have no symptoms and are discovered at autopsy. Roentgen findings are present in about 50 per cent of cases. If they can be removed in toto the prognosis is good.

Dr. A. C. Rembe read a paper "Childhood Tuberculosis." Roentgen slides of different types were presented. The essential points of diagnosis are the history, the exposure, the reliable and delicate Mantaux test, symptomatology, roentgenology and physical examination. Each of these was discussed at length. In differential diagnosis elimination of focal infection is of great importance.

### PIERCE COUNTY MEDICAL SOCIETY

Pres., C. F. Engels; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held at Tacoma, Feb. 11, in room 316, Washington Building, President C. F. Engels in the chair. Minutes of the previous meeting read and approved.

A communication was read from the Hertz Driv-ur-self Company, authorizing special concessions for members of the Pierce County Medical Society.

The application of Dr. Hillis F. Griffin was ballotted on, and he was unanimously elected a member of the society.

#### PROGRAM

"Management of Contagious Diseases," Dr. S. M. Creswell. Attention was called to a few points on the following contagious diseases: (1) Diphtheria. He stated that most deaths occur from cardiac failure. (2) Scarlet fever. Most deaths are due to toxemia. (3) Cerebrospinal fever. Most deaths occur as a result of the infection. Several emergencies were discussed which might arise in these diseases, and measures suggested to meet them. Immediate serum reaction is an emergency in any of these cases and it could be prevented by giving the serum or antitoxin intravenously, diluted with about 95 parts of saline solution. The paper was discussed by Drs. Charles McColl, J. B. Robertson, G. E. Griffith and W. B. Penney.

"Surgical Problems of Constipation," Dr. F. S. Herrmann. The many different mechanical and surgical conditions were mentioned which might produce the symptom of constipation. An appeal was made for a thorough rectal examination of every case in which constipation is a symptom. The paper was discussed by Drs. E. W. Janes and A. S. Monzingo.

"Professional Collections." Mr. George Milsted gave an interesting and instructive talk on the legal aspect of collecting doctors' bills.

### SPOKANE COUNTY MEDICAL SOCIETY

Pres., C. B. Ward; Secty., R. P. De Riemer

The regular meeting of Spokane County Medical Society was held at Spokane, February 13, in the auditorium of the Paulsen Medical and Dental Building. About fifty members were present.

Arrangements were made for formation of a Clinical Society under the auspices of the Spokane County Medical Society for the purpose of frequent entertainment of visiting doctors of the Inland Empire.

The following program was presented: Dr. F. C. Harvey read a paper on "The Eye, the Light of the Body."

Dr. F. C. Gibson of Potlatch, Ida., gave a case report of an x-ray burn.

Several reels of thorough and instructive motion pictures were shown from the clinic of Dr. Lorenz Bohler of Vienna. These pictures dealt with the treatment of fractures and were discussed while being shown by Dr. M. E. Steinberg, a visitor from Portland, Ore.

### WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., J. T. Rooks; Secty., C. J. Johannesson

Walla Walla Valley Medical Society held its regular monthly meeting at Grand hotel, Walla Walla, Feb. 13. A banquet preceded the program.

Dr. Albert Mathieu of Portland read a paper on "Lipiodol Injections as a Diagnostic Aid in Gynecology." This is an aid in differential diagnosis between tumors of the female generative organs and the pelvis and such conditions as infection of the tube and cysts.

Dr. T. W. Adams of Portland read a paper on "Indications and Contraindications of Cesarean Section." This is one of the most serious surgical procedures as far as maternal fatality is concerned. Only experts should undertake the work.

Dr. W. A. Pratt of Walla Walla gave a brief survey of records of cesarean sections in that city during the past three years. There was a total of twenty such operations with no maternal deaths. He advised a more complete study and careful diagnosis previous to operation.

### PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., W. O. Bell, Secty., F. A. Brugman

A meeting of Puget Sound Academy of Ophthalmology and Oto-Laryngology was held at the College Club, Seattle, Jan. 28. The retiring president, Dr. Will Otto Bell, entertained the members at dinner.

The following officers were elected for the ensuing year: President, Dr. Walter F. Hoffman, Seattle; First Vice-president, Dr. Albert B. Murphy, Everett; Second Vice-president, Dr. A. W. Howe, Tacoma; Secretary-treasurer, Dr. Francis A. Brugman, Seattle.

## BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Treatment in General Practice. By Harry Beckman, M.D., Professor of Pharmacology, Marquette University Medical School, Milwaukee, Wis. Octavo volume of 899 pages. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $10.00 net.

The present volume represents the best clinical teaching as to treatment at the present day and almost hour. The writer attains this end by quoting verbatim in many instances the pro's and con's from authorities on the subject. Thus, under treatment of pneumonia, a page and a half is quoted from Cole on specific serum, and over nine pages are taken from Locke's paper reviewing the results of using specific serum in type I pneumonia. The upshot of it all is that at present specific treatment has not given better mortality results than other treatment, except in he hands of Cole at the Rockefeller Institute. The use of glucose intravenously, oxygen and digitalis, the latter as a routine remedy, are approved. Sufficient morphine is also advised to keep the patient comfortable. Fresh air to the extent of extreme exposure of the patient and nurse is not recommended. The latest method of giving 5 per cent $CO_2$ in oxygen at intervals to cause strong respiration and free the bronchial tubes of obstruction and thus prevent atelectasis is not mentioned. On the whole, the treatment of pneumonia described is sane and consists of good nursing, fresh air, opium and digitalis. It is very probable that many patients are overtreated. The reviewer had over a thousand cases of pneumonia under his care in the Army and was more impressed by the outdoor treatment than by any other means. Of the many influenza patients treated from the beginning outdoors on porches, not one developed pneumonia. The lowest mortality in the Army was among patients treated in tents.

Another common disease, chronic cholecystitis, also receives sensible consideration. The author is quite emphatic concerning the so-called Lyon nonsurgical drainage treatment and the reviewer heartily agrees with him. He says: "The enthusiasm of himself (Lyon) and his followers is at times almost hilarious, but they claim results in almost all the ailments to which man is heir, and they certainly do not show that the mental attitude of their patients is not tremendously affected by the atmosphere of almost religious awe with which the institution of a duodenal 'drain' has come to be surrounded." Both Soper, and Hurst in England, have found that magnesium sulphate by the mouth accomplishes all that the Lyon treatment does. Beckman has little to offer in treatment of gallbladder trouble except diet, and he would have done well to have devoted more space to surgical measures. Also hypothyroidism is not touched upon, although very common in middle-aged women, but the treatment of myxedema is carefully considered.

There is a very extensive review of the current treatment of peptic ulcer, chiefly given in the words of the authors of the different methods in vogue. Thus Bevan's classic paper in 1922 is quoted as showing that eminent surgeon's view of medical versus surgical treatment. He, it will be remembered, affirmed that but ten cases out of a hundred need surgical interference. It has always seemed to the reviewer that the type of patient with ulcer is more important than the type of ulcer. For the ignorant laboring man in the charity hospital with a peptic ulcer ninety per cent surgery appeals more strongly to the reviewer, as proper dietary care outside is practically impossible. The reader is left to choose between the various modes of care of peptic ulcer described by Sippy, Alvarez and Smithies, as the author does not express any opinion on the matter. This is one of the chief faults of the book, but is unavoidable where the writer quotes in detail pages from articles by different authorities on the same subject without stating his own views on the same. If one has large clinical experience it is almost impossible not to have arrived at a definite line of treatment in each disease. This the author apparently lacks but he has had the ability to gather together with remarkable success the opinions of the best clinicians on present day medical treatment. It is, as a whole, the most admirable book of its kind in one volume that we know. Winslow.

Practical Psychology and Psychiatry. For Use in Training Schools for Attendants and Nurses and in Medical Classes, and as a Ready Reference for the Practitioner. By C. B. Burr, M.D. Late Medical Director, Oak Grove Hospital (Flint, Mich.) for Mental and Nervous Diseases, etc. Sixth Edition, Revised and Enlarged with Illustrations. 378 pp. $2.75. F. A. Davis Co., Philadelphia, 1930.

Any book which has passed through six editions (the first printed in 1898) must have merit to have stood the test of time. It is a practical manual rather than a textbook, as no volume of this size could begin to adequately cover such subjects as psychology and psychiatry. It is concise, well written and clear with the possible exception of the part dealing with psychology, for which the subject rather than the author is to blame. The author feels that "psychology suffers acutely from refinements in definition," and handles Watson's "behaviorism" without gloves. The description of the practical management and nursing of mental cases is especially recommended, not only to nurses and attendants in institutions for psychiatric cases but also to physicians. It reflects the wisdom and experience of a man who has devoted a long life to the care of psychotic patients.

The casual reader may miss what to the reviewer is the real charm of the book, the author's mental reaction to many of the modern ideas on psychology and mental hygiene. He evidently does not believe that everything is good just because it is new, and is "not strong" for the new methods in education of the young. As opposed to the idea of "self-expression," he holds for the old methods of teaching self-control, self-helpfulness, obedience, discipline and work. He believes in the boy scout movement and universal military training. In reading the paragraph on marriage of the insane the reviewer had a quiet chuckle over the statement, "decision on these matters is difficult, but over the problems the consultee need not concern himself unduly, inasmuch as his advice will rarely be followed unless it happens to coincide with the sentiments of the seeker thereof." Price.

A Textbook on Orthopedic Surgery. By Willis C. Campbell, M.D., F.A.C.S., Professor of Orthopedic Surgery, University of Tennessee, College of Medicine, Memphis. Octavo volume of 705 pages, with 507 illustrations. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $8.50.

The first thing that strikes one on picking up this volume is the logical and orderly way the field of orthopedics is covered. The author has attempted to treat the subject briefly and in a practical way, and in this he has succeeded very well. The first chapter is on the method of examination of each joint and the normal for that joint. The next deals with braces and then on to the pathologic conditions and treatment.

A departure from the usual work on orthopedics is the inclusion of fractures and dislocations, there being two chapters devoted to these. Theory has little space in the book and the text has the earmarks of being based on the author's own experience and opinions rather than a collection of ideas from others' writings. This allows much ground to be covered in a small space. Those acquainted with the author's work know him to be a practical surgeon and an excellent teacher, and he has demonstrated these qualities in a definite way in this volume. It is a book everyone should have who attempts to treat any orthopedic condition. Joe Brugman.

The Essentials of Histology. Descriptive and Practical. For the Use of Students. By Sir Edward Sharpey Schafer, F.R.S. Professor of Physiology in the University of Edinburgh. Twelfth Edition. Revised by the Author, with the cooperation of H. M. Carleton, Ph.D., Lecturer on Histology in the University of Oxford. 628 pp. $5.00. Lea & Febiger, Philadelphia, 1929.

As a reference work this volume contains the latest information in many fields in concise form. The pictures are very good throughout. The nerves, nerve endings, the spinal cord and brain are considered at length. Obviously the author has a special interest in nerve tissue. In the sections devoted to the nervous system the illustrations are especially good. In the appendix most of the old reliable methods are given in full detail so that a student can easily follow the directions. Some of the later special methods are also given, such as intravitam staining and Cowdry's method of staining for mita chondria. As is stated in the title, the volume is essentially for students. Mosiman.

Otologic Surgery. By Samuel J. Kopetzky, M.D., F.A.C.S. Professor of Otology, Polyclinic Medical School and Hospital, New York, etc. Second Revised Edition. 104 Illustrations, including 4 Color Plates, 21 Charts. 553 pp. $8.00. Paul B. Hoeber, Inc., New York, 1929.

The subject in this volume is divided into chapters dealing with diseases of the middle ear, operations on the ex ternal auditory canal, incision of the membrana tympani, operations on the middle ear through the external auditory meatus, the simple mastoid operation, radical mastoid operation, surgery of the labyrinth, otogenous systemic infections including sinus thrombosis, surgery of the meninges, surgery of brain abscess, and laboratory aids to otologic diagnosis. The basis for each consideration is pathology which is stressed, and the surgical methods advocated are those of merit proven by practical experience. Minute detailed descriptions of each technic, accompanied by definite reasons for their recommendations, are given and, where there might be a question as to the value of one technic over another, the author from his own vast experience advances reasons why he uses a certain one. The chapter on laboratory aids gives briefly the essential practical aids to diagnosis and their relative values and has thus increased the book's value as a reference book. In symptomology diagnosis and indications for surgery are elementary, concise and practical enough to be of great value to the busy general practitioner. It is scientific, thorough and detailed enough to be of inestimable value to the student of otology and otologic surgeon. As a whole, it contains the essentials for a universal reference book on otologic surgery. WALTZ.

DIAGNOSTIC METHODS AND INTERPRETATION IN INTERNAL MEDICINE. By Samuel A. Loewenberg, M.D., F.A.C.P. Assistant Professor of Medicine, Jefferson Medical College, Formerly Assistant Professor of Physical Diagnosis at the Medico-Chirurgical College and the University of Pennsylvania, Visiting Physician to the Philadelphia General Hospital, etc. With 547 illustrations, some in colors. Cloth. 1032 pp. $10.00. F. A. Davis Co., Philadelphia.

This is a book in which chief attention is given to the clinical side of medicine, but one chapter being allotted to the interpretation of laboratory findings. It is, therefore, particularly adapted to that supposedly vanishing but ubiquitous individual, the general practitioner.

The first portion, relating to external examination of the body including postures, gaits, facies and lesions on the surface, with brief description of dermatology and methods of exploring and diagnosing lesions of the eyes, ears, nose and mouth, is fairly complete. The photographic illustrations are numerous, but not especially good or illuminating in the diagnosis of skin lesions. The lips, tongue and gums receive careful attention but there seems to be no description of lesions on the buccal membrane of the cheeks, as leukoplakia, pigmentations of Addison's disease, stomatitis, Vincent's disease, mucoceles and tumors, lues or tuberculosis. Cysts of the neck are described as branchial or thyroglossal, but it is not noted that the latter are always situated in the midline. On the whole, this part of the book is very well done and, though necessarily the descriptions are brief, they bring out diagnostic points that may be recognized at a glance, and are often of the utmost importance, as the supraclavicular sentinel glands in thoracic or abdominal malignancy.

The section on examination of the chest is admirable and most meticulously complete as regards topographic anatomy, appearances on inspection, and signs and methods of examination. The discussions of the diagnosis in some of the various special diseases of the lungs are not so good. For instance, in atelectasis the causes of the condition are omitted, as surgical operations, and the characteristic roentgen findings are not noted. The same general remarks may be made about examination of the heart. The descriptions of the various methods of examination are most thorough.

An attempt is made to distinguish between functional cardiac murmurs caused by dilatation of the valve orifices, uneven tension of the papillary muscles and inelasticity of the valve leaflets. This is impossible in practice and one has to be fairly keen to discriminate between the organic and functional murmurs, without venturing to determine their origin. The functional systolic murmur is stated "to be heard rarely over the aortic area." Functional systolic aortic murmurs were often found in soldiers in the late war. The absence of any other signs of disease and the age of the patients made the diagnosis simple. Cardiorespiratory murmurs were also very common, usually heard at the end of inspiration and not when the breath was held. They are not mentioned specifically in this book.

The author includes syphilis as the first cause of aortic stenosis. This is probably never a cause, although thought to be so by Mackensie. Syphilis invariably leads to dilatation of the aorta and in none of the cases seen by the reviewer has lues been a factor. As is so often the case, the author devotes no space to chronic cholecystitis, the most common of chronic digestive disorders, nor does he discriminate between duodenal and gastric ulcer which is most important as to treatment and prognosis. An elaborate table is given for distinguishing gastric ulcer from gastralgia. Is there any such entity as gastralgia? The reviewer knows none. Taken as a whole the book is particularly strong in its description of the methods of physical examination and signs. WINSLOW.

SURGICAL DISEASES OF THE THYROID GLAND. By E. M. Eberts, M.D. Surgeon to the Montreal General Hospital, etc. With the Assistance of R. B. Fitzgerald, M.D. and Philip G. Silver, M.D. Illustrated with 48 Engravings. 238 pp. $3.50. Lea & Febiger, Philadelphia, 1929.

The authors of this volume have expressed in a practical way most of the essential knowledge in relation to goiter. The pathologic classification is that used at the Montreal General Hospital, which furnished the material used in this book, and varies somewhat from that of Plummer, but is not sufficiently different to create much controversy. It contains many valuable lessons gleaned both from the literature and from personal experience.

It is a convenient reference work by which one can gain the essential facts without a great deal of reading. In the way of criticism the preoperative and postoperative treatments are not sufficiently described in detail, nor are postoperative complications and their treatment sufficiently covered. These men advocate local anesthesia which has gained in favor in some quarters and disfavor in others. No claim is made for any new methods of treatment. All in all, the work is full of good sound advice. B. T. KING.

A MANUAL OF PROCTOLOGY. By T. Chittenden Hill, Ph.B., M.D., F.A.C.S., Instructor in Proctology, Harvard Graduate School of Medicine, etc. Third Edition, Thoroughly Revised. Illustrated with 86 Engravings. 272 pp. $3.50. Lea & Febiger, Philadelphia, 1929.

This work, while only a manual, is unusually comprehensive in its scope. It has deservedly gone on to its present third edition. As a reference hand book it appears of more value than some of the more extensive text books which have been published. While the author confines himself in a general way to the best accepted opinions and

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generally used surgical technic, he does not enter into discussion of subjects which are still in doubt, but in concise language gives his own personal viewpoint, or in the case of treatment technic the method he has found the most valuable in his own practice. The illustrations are plentiful and well interspersed to explain the text. If we were only allowed one book on proctology for our library, we doubt if we could find a more satisfactory one than this little manual.

CROOKALL.

MATERIA MEDICA AND THERAPEUTICS, Including Pharmacy and Pharmacology. By Reynold Webb Wilcox, M.A., M.D., LL.D., D.C.L., Consultant in Medicine to St. Marks Hospital, New York, etc. Twelfth Edition, Revised in Accordance with the United States Pharmacopoeia X and the National Formulary V, with an Index of Symptoms and Diseases. 690 pp. $5.00. P. Blakiston's Son & Co., Inc., Philadelphia, 1929.

This issue of this authoritative and standard work was necessitated by the appearance of the United States Pharmacopoeia X, which called for rewriting of the section devoted to Pharmacy and Materia Medica. The first part, dealing with Materia Medica and Pharmacy, is divided into two sections, the inorganic and the organic materia medica. Demonstrations of drugs and their preparations and practice in prescription writing are also included. The National Formulary V contains preparations which have the sanction of general use and are herein described. The index of symptoms and diseases is valuable for the student and practitioner. One will not go astray in placing confidence in the information obtained from this volume.

GETTING WELL AND STAYING WELL. A Book for Tuberculous Patients, Public Health Nurses and Doctors. By John Potts, M.D., Fort Worth, Texas. Second Edition. 221 pp. $2.00. The C. V. Mosby Company, St. Louis, 1930.

This book is intended to convey information to the tuberculous patient and his friends as to how best to meet the necessities of his condition. Also it will not be amiss for reading by physicians. Many practical phases of the tuberculous problem are here presented, illustrating the modern methods of treating the disease. The chapter on the sanatorium discusses the necessity of such an institution and why the patient should take advantage of it. The chapter on the outlook should give special encouragement to this class of patients, showing that recovery is possible, if one plays the game according to accepted rules This little volume can be recommended for people with this disease.

NURSING IN EMERGENCIES. By Jacob K. Berman, A.B., M.D., F.A.C.S., Assistant in Surgery, Indiana University School of Medicine, Indianapolis, etc. With 109 Illustrations. $2.25. The C. V. Mosby Company, St. Louis, 1929.

Since all nursing may become emergency work at any moment, when the nurse must act quickly and accurately, this book is written for the purpose of presenting handy information that she may acquire at short notice. It presents every day incidents which may occur in the ordinary practice of medicine and surgery. Abundant illustrations serve to amplify the text so that the reader can quickly ascertain the necessary action for the situation under consideration. Subjects are considered, such as drugs and antidotes, hemorrhage, shock, contusions and wounds, bandaging, obstetric and gynecologic emergencies. The nurse will find this a very useful booklet to suggest how to meet emergencies.

INCOMPATIBILITY IN PRESCRIPTIONS and How to Avoid It, to which is added a Dictionary of Incompatibilities. By Thomas Stephenson, D. Sc., Ph.C., F.R.S. Edin. F.C.S., Editor of the Prescriber, etc. New Edition, Revised and Enlarged. 61 pp. $1.50. P. B. Hoeber, Inc., New York, 1929.

Incompatibility of prescribing is a subject of which the ordinary physician has inadequate information. In this small volume the subject is systematically presented with the examples illustrating various difficulties encountered. Chemical incompatibility results in insoluble compounds, evolution of gas, decomposition which may be undesirable if not detrimental. Physical incompatibility produces insolubility, immiscibility, change of color, bulk or molecular. Therapeutic incompatibility may result in unexpected effects of drugs. After dealing with these matters a dictionary of incompatibles is presented, in which each drug is considered alphabetically with specifications as to solubility, incompatibility and other important features. This booklet contains much valuable information.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 13, No. 4 (Philadelphia Number, January 1930). Octavo of 301 pages, illustrated. Per Clinic year, July, 1929, to May, 1930. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This volume contains discussions of many interesting and important conditions of diseases which occur in the practice of every physician. There are three reports by different Philadelphia internists on phases of arthritis. Nine different men discuss various phases of cardiac and circulatory pathology. Many other pathologic conditions are also presented, making this a volume well worth reading.

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ETIOLOGY OF INFANTILE SPASMOPHILIA. H. J. Gerstenberger, J. I. Hartman and G. R. Russell, Cleveland, and T. S. Wilder, Philadelphia (*Journal A.M.A.*, Feb. 22, 1930), discuss the general characteristics and mode of development of spasmophilia, and present additional evidence as a valid substantiation of the theory advanced by them on a previous occasion regarding the etiology of infantile spasmophilia; namely, that three factors are essential to its development: (a) rickets; (b) exposure of the rachitic infant to the influence of the antirachitic factor in one form or another in a sufficient degree to produce some healing, and (c) interruption of the exposure or inadequacy of the exposure. They present the report of the development of typical spasmophilia due to interrupted therapy in two rachitic infants who were exposed to sunlight and due to inadequate therapy in one rachitic infant who received human milk possessing some antirachitic powers. The two infants were exposed daily at noon for one hour to sunlight as it passed through glass that was more permeable to its ultraviolet rays than in ordinary window glass. Approximately sixty days after February 1, or twenty-four days from March 9, the first symptoms of spasmophilia appeared. The most marked spasmophilic symptoms were observed from eighty to ninety days after the first of February. The other infant developed spasmophilia after and while being fed milk from a wetnurse whose skin (arms, face, chest triangle) was exposed daily to the summer sun for forty-five minutes. This milk had antirachitic power but not in a marked degree, and represented for this rachitic infant an inadequate intake of the antirachitic factor, although it also may have been of an interrupted character.

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## ORIGINAL CONTRIBUTIONS

### EPIDEMIC ENCEPHALITIS

AFTER TEN YEARS*

GEORGE E. PRICE, M.D.
SEATTLE, WASH.

Approximately ten years ago, following the world war, an epidemic of a peculiar infection swept over this country from east to west, continued to present many acute cases for about three years, then gradually subsided until at the present time we are only seeing an occasional new case, the disease being now endemic rather than epidemic. The history, symptomatology and pathology of epidemic encephalitis in its acute form are so well known that it would be out of place to discuss them here. My purpose is to bring before you the present status of the infection, stressing the chronic cases and residua.

The majority of the new cases of epidemic encephalitis now seen are mild or subacute, with very little rise in temperature, sometimes difficult of diagnosis, but fortunately better as to prognosis than the earlier cases of the epidemic. Many of what were at first thought to be sequelae or residua of epidemic encephalitis have proved to be manifestations of a chronic infection, as acute, inflammatory changes have been found in association with the degenerative lesions.

Relapses in encephalitis are common. In 1922, I reported in the *Journal of the A.M.A.*[1] a case with recurrence of symptoms one and one-half years after apparent recovery. At the time this was the longest interval between the initial attack and remission on record. Since that report remissions or relapses after much longer intervals have been recorded and I saw one case with a flaring up of symptoms after seven years of a normal interval except for occasional vertigo.

The late or chronic manifestations of epidemic encephalitis may remain as a continuation from the acute attack, may appear during a remission, or, as sometimes seen in parkinsonism, may develop slowly without known relation to the acute invasion, the latter having been so mild as to cause its true nature to be unsuspected.

For convenience in presentation, the late symptoms may be classified as follows: Motor, sensory, psychic, ocular, aural, respiratory, glandular and those referred to the vegetative nervous system.

*Motor symptoms.* In 1922, Levy[2] from the Clinic of Pierre Marie, in Paris, reported his observations on one hundred and twenty-nine cases with late effects of epidemic encephalitis; of these seventy, or 54 per cent, presented the parkinson syndrome, and forty-three some form of excitomotor manifestation. It will be seen, therefore, that parkinsonism represents slightly over half of all the late manifestations. With this parkinson syndrome in epidemic encephalitis we are all more or less familiar.

Hall[3] has pointed out certain differences between postencephalitic parkinsonism and ordinary paralysis agitans. It is exceptional to find the typical pill-rolling fine tremor in postencephalitic cases, while it is common to find other residua in association with the postencephalitic parkinsonism. The onset and progress are also apt to differ in the two conditions. The mask-like face is usually somewhat slow and late in developing in paralysis agitans, while in parkinsonism it is early and often rather abrupt in appearance. Moreover, parkinsonism may appear at any age, while paralysis agitans is essentially a disorder of the arteriosclerotic period. Parkinsonism may be continuous with the acute illness but more commonly appears months or even years after health has apparently been restored.

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* Read before King County Medical Society, Seattle, Wash., January 6, 1930.

Late excitomotor symptoms are more frequent than late paralytic disturbances.

Epileptiform convulsions following encephalitis were not observed by Levy, but have been recorded by others. I have seen epileptiform attacks both as early and late manifestations, and called attention to them as a rare early symptom in a paper published in 1922.[4]

Choreic movements, when present, are increased by the same factors that increase the movements of ordinary chorea, fatigue, emotion and cold; they cease, as a rule, during sleep.

Myoclonic movements may appear in a single muscle or group of muscles. Those I have seen were limited to the face. In one patient I was able to keep under observation, the movements gradually became less and less marked, disappearing in about two years.

Bradykinetic movements are slow, regular, rhythmic, of large amplitude and most marked in the proximal part of the extremities. When the neck muscles are involved, the resemblance to spasmodic torticollis is marked. Again, postencephalitic dystonia resembling Wilson's disease has been reported by Brock and Katz,[5] Bing and Schwartz, and others.

Other excitomotor phenomena that have been described are hiccough, and spasms of the facial and eye muscles.

Among the paralytic motility disorders of late encephalitis are found hemiplegia and very rarely paraplegia. External opthalmoplegia is not infrequent.

Muscular atrophy of the spinal type in chronic encephalitis has been reported by Carr,[6] while the combination of extrapyramidal rigidity and amyotrophic lateral sclerosis after epidemic encephalitis was recorded by Guillain and Aljonanine, amyotrophy after encephalitis having been previously reported by Wimmer[7] and Froment. Finally, the myasthenic syndrome in chronic epidemic encephalitis has been observed several times, Wimmer and Vedmand[8] reviewing six articles in 1926 and adding two new cases.

Under motor disturbance would also come symptoms of a cerebellar type, disturbance of equilibrium, asynergia and the peculiar slow, guttural and sometimes explosive speech. Such cases have been reported by Delbeke and Bogaret, Alberta Jenkins and Schaller of San Francisco.

*Sensory symptoms.* Under the title "Lemniscus Symptoms Following Epidemic Encephalitis," Cadwalader[9] reported three cases with bilateral impairment of deep sensation. Levy reported localized pains and paresthesias, occasionally with radicular distribution. Abnormal sensations, such as hunger, thirst, air hunger and prolonged fatigue, have been noted, but in general it may be said that sensory disturbances of any kind play an unimportant role as compared to the motor symptoms.

*Mental symptoms.* Residual mental symptoms occur rather frequently in epidemic encephalitis. Much has been written about these symptoms and, as one would expect from the diffusion of the pathologic lesions, the mental changes have been multiform, yet from the many articles written on the subject one finds that certain facts stand out through frequent repetition. (1) Mental changes in late encephalitis are common in children and rare in adults. (2) The younger the child the more severe the late mental symptoms are apt to be. (3) The usual mental change in children may best be described as "conduct disorder" or "character change." (4) Marked mental deterioration, as in the so-called idiot group, is practically limited to the younger children. (5) The more acute and severe the onset of the encephalitis, the more apt are the mental disorders to follow. (6) Neurologic signs may or may not be present in association with the mental symptoms.

Marked mental deterioration, fortunately, is far from the rule. The usual picture is that of a difficult child and one writer on the subject, Marshall,[10] described the "restless, naughty encephalitic child." The milder symptoms are described as irritability, restlessness, inability to concentrate and dulling of the emotions. More advanced character changes consist of antisocial tendencies, quarrelsomeness, emotional instability, disobedience, hypermobility. The children become forward and impudent but act on the spur of the moment rather than from premeditation. The intellect is, as a rule, preserved. According to Ebaugh, bad sexual tendencies or sexual precocity may be shown.

Strecker[11] found that the behavior difficulty in children in the majority of instances, was practically a continuation of the acute illness rather than its sequel, although postponed six months in four cases and three, five and eight years respectively in three other cases. The adult cases, as already stated, are rare, so much so that in discussing Strecker's paper, Russel of Montreal said that the behavior problems were never seen in cases of encephalitis occurring in adults. Others, however, have written of mental changes in adults and I had one such case under observation for some months, a woman forty years old who had undergone a complete change in character and disposition, following an unmistakable attack of epidemic encephalitis. In adults there is the same antisocial attitude as in children, a marked diminution or absence of affectivity, quarrelsomeness, impulsiveness and weakness of the will.

A case of reported encephalitic paranoia (Kwint)[12] with delusions of poisoning and of being affected by electricity and magnetism, is only here mentioned because of its rarity.

*Ocular symptoms.* Hohman,[13] in 1925, reported four patients with involuntary turning up of both eyeballs for several minutes or hours at a time, with no muscle paralysis or even imbalance, and with onset varying from one to six years after the acute attack of encephalitis. Others have reported these spasmodic movements of the eyeballs, also spasmodic closure of the lids, as late effects of encephalitis.

External opthalmoplegia, especially weakness of the movement of convergence of the eyes with resultant double vision, is a common late encephalitic symptom according to Levy. This writer also found slow contraction of the pupils both to light and accommodation and particularly diminution or loss of the convergence reaction, while the contraction to light persists. The Argyll-Robertson pupil is comparatively rare but has been observed. Krabbe,[14] in 1925, reviewed all available reports of the Argyll-Robertson pupil in encephalitis and added three new cases.

*Aural symptoms.* Disorder of the labyrinth and auditory nerves may be sometimes found in late epidemic encephalitis, and when present are manifested by such symptoms as vertigo, nystagmus and tinnitus aurium.

*Respiratory disorders* constitute an interesting and somewhat bizarre group. They may be divided into (1) disturbances in rate, (2) disturbances in rhythm, (3) respiratory tics.

Disturbances in respiratory rate may be either paroxysmal or permanent. The most frequent of all the respiratory changes is paroxysmal rapid breathing. One such case was reported by me before the Philadelphia Neurological Society in 1921. The patient, a boy of eleven years, developed his respiratory difficulty about one year after his acute attack of encephalitis. His breathing would become suspended for a brief interval, during which time he would complain of headache and dizziness, and would become somewhat cyanotic. Then would follow a period of rapid breathing, lasting in one instance for two and one-half minutes. The spells averaged four or five in twenty-four hours and were not associated with unconsciousness.

A case with attacks of diminished respiratory rate accompanied by mental anxiety and a feeling as if the patient were receiving insufficient air was seen by me recently.

Turner and Critchley[15] believe that the cause of these disorders lies in a derangement of the involuntary psychomotor control of respiration, placing the lesion at a higher level than the respiratory centers.

*Disorders of sleep.* The somnolence seen so frequently in the early acute cases gave the name of lethargic encephalitis or the more popular but inaccurate term "sleeping sickness" to the disease, and late sleep disturbances are not uncommon. The most frequent of these is a peculiar reversal of the sleep rhythm. For some time after the acute symptoms have subsided many encephalitics, like the cats, sleep in the daytime and stay awake nights. This usually wears off after several months, but from what patients have told me I judge this symptom to be somewhat annoying. True narcolepsy is rare, but does occur. Spiller[16] of Philadelphia reported three cases and referred to others in the literature.

*Cerebral adiposity.* As a late manifestation of epidemic encephalitis this was reported early after the epidemic, in one case following an exceedingly mild acute attack. One patient gained seventy-five pounds in two years, and a gain of forty pounds is not unusual. Whether hypophyseal or infundibular pathology is the cause has not been definitely settled. In one instance, a man thirty-five years old, there was also genital atrophy and the appearance of secondary sexual characteristics (Barkman). I have seen two of these adipose cases, and the change in their appearance was most dramatic.

Diabetes insipidus as a sequel of epidemic encephalitis has been reported several times.

*Vegetative system.* Increased salivation is seen quite commonly in the parkinsonian cases, sometimes to actual drooling, but may be present without the parkinsonian syndrome. Excessive perspiration is another vegetative disorder sometimes seen.

*Serology.* In the long standing cases, the spinal fluid, although it may be free from cells and globulin, will usually show an increase in sugar.

### TREATMENT

Stramonium as a remedy in the treatment of encephalitic parkinsonism was introduced in 1925 by Juster,[17] and we all remember the patients presented before this society by Drs. Jacobson and Epplen,[18] showing remarkable results obtained by the use of large doses of this drug. Hyoscine, largely used before stramonium was introduced, is less effective than this latter drug in relieving the muscular rigidity, but is of much value in reducing the tremor.

Banisterin, an alkaloid isolated from the banisteria caapi, a plant indiginous to South America, has also been used in chronic encephalitis. This drug is said to have a surprisingly favorable effect on the muscular rigidity, but not on the tremor of parkinsonism. Nicotine has also been tried but is inferior to the remedies just mentioned.

Quite recently my attention was called to two articles advocating the use of radiotherapy in the treatment of epidemic encephalitis. One of the writers, Von Weiser, claims to have obtained favorable results in the chronic cases, while Norvoli states that he found radiotherapy of value in the acute but of no value in the chronic cases. Good results are also claimed from ultraviolet ray treatments (Jaffé). In regard to these methods there does not as yet appear to be sufficient data from which to draw conclusions.

As to the treatment of the conduct disorders in children, while the outlook for recovery is not very promising, the children respond best to simple methods of discipline (Bond and Partridge[20]). It is inadvisable to try to educate and train these children in association with normal children (Strecker).

### CONCLUSIONS

1. Lethargic encephalitis is now endemic rather than epidemic.

2. Cases occurring at the present time are on the whole less severe and of better prognosis than those appearing during the epidemic.

3. Of the chronic or late manifestations of the disease, motor symptoms greatly predominate, the parkinsonian syndrome alone constituting slightly over one-half of all the cases.

4. Late mental symptoms are in direct proportion to the youth of the patient and the severity of the initial infection.

5. As there is still no specific treatment for this malady, therapeutic measures consist in trying to ameliorate the individual symptoms and in building up the patient's resistance.

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# PACHYMENINGITIS HEMORRHAGICA INTERNA *

Norman W. Clein, M.D.
SEATTLE, WASH.

This condition is a hemorrhagic inflammation of the inner surface of the dura mater. It may be acute or chronic, the symptoms depending upon the duration of the pathologic process. It is the only primary important lesion of the dura which occurs in infancy. The close alliance between pachymeningitis hemorrhagica interna and subdural hemorrhage will be illustrated in the following two case reports:

Case 1. B. C., age five months. A full term, normal infant, bottle fed and making a regular gain. A convulsion occurred at six weeks, again at four months, and three days prior to the last illness. These spells lasted from two to five minutes, and the cause was not determined at the time. Recovery from each spell was a matter of a few days and the baby seemed to develop normally.

At five months a convulsion began at 5 a.m. and continued, regardless of treatment, until 10 a.m. A bulging fontanelle was present. A spinal puncture at this time revealed a golden yellow fluid under an increased pressure; smears and cultures were negative. Another puncture three hours later, both spinal and cisternal, revealed a pink fluid; the third puncture six hours after the first gave a very bloody fluid. The baby became progressively worse, showing signs of cerebral compression, and the temperature rose to 107° before death the same day.

Postmortem findings: An infant well developed, having a head somewhat enlarged for its age. On opening the skull much dark-colored fluid blood escaped from within the calvarium. The emissary veins coming from the superior longitudinal sinus on both sides showed recently formed vessels, some of which were ruptured and contained old, clotted thrombi, others more recent thrombi, and some still exuding fluid blood. On account of the massive hemorrhage no cystic membrane could be found.

Case 2. J. P., age sixteen months. A well developed infant, bottle fed after the fifth month, who had rickets at eight months, a severe whooping cough at one year and a persistent nasal discharge for the last four months. He had a slight upper respiratory infection for three days preceding the convulsion.

A convulsion lasting six hours was relieved by a spinal puncture, 30 c.c. of clear fluid being obtained which was sterile. He improved for two days, then gradually developed a stupor and a left-sided paresis. Later a generalized convulsion and deep coma occurred. Spinal and cisternal punctures at first gave pink fluid, then darker red fluid which also was sterile. After each puncture the infant could be aroused and would improve. A partial paralysis of the entire left side continued for ten days and gradually subsided.

One month later the tonsils and adenoids were removed. A week following this he developed a suppurative otitis media and subsequently a severe septic temperature with an edema and discoloration of the left eye, which we interpreted as a partial cavernous sinus thrombosis or an ethmoiditis. A complete recovery followed within several weeks.

## ETIOLOGY

This condition was described one hundred years ago and many theories have been advanced as to its cause, the most plausible being the infectious theory of Finkelstein who maintains that, following a rhinitis they develop a thrombosis of the nasal and ophthalmic vessels, leading to a partial thrombosis of the cavernous sinus and finally rupture of the small capillaries in the dura due to the passive congestion. This seems plausible in view of the cases cited. It occurs between the ages of three to five months more frequently than after the age of one year.

## PATHOLOGY

Whether the inflammatory process comes before the hemorrhage is in dispute, but no symptoms are manifest until hemorrhage occurs. It is probably not inflammatory inasmuch as the cystic fluid is a transudate instead of an exudate. Hemorrhage must be the predominating lesion and is usually located over the convexities near the center or on the sides. No false membranes are found where a large effusion is present. Following slight hemorrhage from the thin walled capillaries formed from the endothelium of the dura, organization of the clot occurs, followed by absorption of the blood, leaving a cystic wall containing the clear fluid. Microscopically, new thin walled capillaries can be seen, forming from the subendothelial layer which is very vascular. Other hemorrhages may occur at the same site, absorbing and forming lamellated cystic layers each time. Pachymeningitis hemorrhagica interna and subdural hemorrhage are closely related, as the above description emphasizes.

## SYMPTOMS

The symptoms depend entirely upon the amount and location of the hemorrhage rather than the inflammatory process. They are those of meningeal irritation and increased intracranial pressure, such as (1) vomiting, (2) convulsions, (3) coma, (4) slow pulse and respiration, (5) choked disk (chronic cases), (6) fontanelle bulging, (7) fever may be present, (8) large head and sutures may separate, (9) the spinal fluid may be golden yellow, pink or bright red, depending upon the age of the hemorrhage, (10) symptoms may be localized.

## DIAGNOSIS

Diagnosis is made on the signs of cerebral compression, a bloody spinal fluid which is sterile, and

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* Read before Annual Meeting of North Pacific Pediatric Society, Seattle, Wash., Jan. 25, 1930.

in addition in the chronic cases by signs of external hydrocephalus. A diagnosis is impossible without hemorrhage from the subdural area.

### DIFFERENTIAL DIAGNOSIS

Luetic hydrocephalus can be differentiated by the positive Wassermann reaction and the chronicity. Epidural hemorrhage which is of slower onset and usually follows injury. Meningitis which is of slower onset, higher fever; and spinal fluid findings are diagnostic.

### PROGNOSIS

Some cases recover completely, while others may have paresis and spasticity. The condition may be chronic with remissions. Rosenberg shows that of ten cases followed after many years, eight were idiots of one type or another.

### TREATMENT

The treatment is symptomatic, frequent spinal and cisternal punctures to drain the hemorrhage being most essential. Injections of whole blood should be given as often as indicated. Fontanelle puncture is not recommended as it is a procedure which may be dangerous in this type of a case.

### DISCUSSION

The first case represents the type having several convulsions at intervals of months with apparently complete recovery, finally terminating in death due to a massive hemorrhage. The eye grounds in this case showed some edema, while in the second case, due to the acuteness of the hemorrhage, the eye grounds were normal. The symptoms in both cases were those of meningeal irritation and cerebral compression. The second case, which recovered, had only one hemorrhage which was drained shortly after the onset, and was chiefly over the right cerebral cortex.

### SUMMARY

The close alliance between subdural hemorrhage and pachymeningitis hemorrhagica interna is shown by the above cases. Early diagnosis and treatment are essential for a good prognosis.

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Direct Irradiation of Kidney. Benjamin H. Hager, Los Angeles (*Journal A.M.A.*, March 15, 1930), reviews briefly the results of two cases of renal malignant conditions treated by high voltage roentgen therapy, and deduces from the patients' behavior to irradiation a possible application of the procedure to certain cases of idiopathic renal hematuria. Analysis of the results of this treatment in these two cases leads Hager to propose the use of high voltage roentgen treatment in certain protracted cases of idiopathic hematuria, which are not amenable to local procedures. The records reveal thirty-seven cases of essential hematuria. Of these, all but three responded to the customary instillations of solutions of silver nitrate, of variable concentrations, into the renal pelvis.

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# INFILTRATING GLIOMA

## SPONGIOBLASTOMA MULTIFORME

## REMOVAL WITH ELECTROSURGICAL KNIFE

Dorrell G. Dickerson, M.D., F.A.C.S.
SEATTLE, WASH.

It is infrequent that one is so fortunate as to remove an infiltrating glioma, especially the malignant spongioblastoma multiforme, with complete functional recovery. The literature abounds with studies of spongioblastomas and we are justly pessimistic when advising surgery or giving a prognosis in rapidly progressive, short history, tumor cases occurring in middle life. These usually prove to be spongioblastomas with a high degree of malignancy and rapid growth following surgical interference.

A number of apparent recoveries are recorded in the literature and the only excuse for reporting this case is the seemingly excellent clinical condition following removal of the growth with the electrosurgical knife. The patient has now passed the seventh month postoperative survival period without any signs of recurrence.* In this particular case, following the report from the pathologist, radiation was withheld, feeling that it was contraindicated in the spongioblastoma multiforme type of glioma, having learned from former experiences and as substantiated somewhat in the studies of Cushing and Bailey, that radiation often times produces interstitial hemorrhage, acute edema, and leads to sudden death.†

This patient was a seaman, 37 years of age, single. His past history was of no consequence.

*Chief complaint*: Headaches, vomiting, blurring of vision, pains in the head and numbness and weakness of the right arm.

*Past history*: For the past year, 1928 to 1929, has had severe nocturnal headaches, chiefly occipital in character, associated with pains and stiffness of the muscles of the neck. During the early part of 1929 he began to vomit and noticed that his vision was failing. Lately he has experienced numbness and weakness of the right hand. While in the Marine Hospital at Port Townsend he had an attack lasting about fifteen minutes, during which time his right arm was temporarily paralyzed. He was unable to speak and complained of impairment of vision in the right half of each eye. He was suspected of having had luetic infection and received the usual course of treatment without benefit. He was transferred to Providence Hospital, Seattle, in a stupor, on August 21.

*Examination*: He was dull when aroused, his speech was thick and he took no interest in his surroundings. A complete mental examination could not be carried out, due to an advanced state of increased intracranial pressure. During the course of examination he yawned repeatedly and moaned, placing his hands to his head.

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* Studies in Intracranial Physiology and Surgery, Oxford Medical Publications, H. Cushing, M.D.

† Roentgen Therapy of Gliomas of the Brain, by Bailey, Sosman and Van Dessel, the American Journal of Roentgenology and Radium Therapy, Vol. XIX, March, 1928, No. 3.

The eyegrounds showed bilateral choking of the discs to about 4 diopters with the left slightly greater than the right. There were hemorrhages in the retinae on each side and marked exudate. The right grip was deficient as compared with the left and the movements of his right arm and forearm were awkward. His deep reflexes were absent in the right arm and decreased in the left. Patellar reflexes on the right side were 3 plus and 2 plus on the left. Tendo achilles reflexes, right 2 plus and left 1 plus. There was a bilateral evanescent ankle clonus and a right Babinski. The postural and stereognostic sensibilities, as well as could be determined, were normal. His mental condition precluded a perimetric study and the high degree of choking of the discs interfered with any detailed eye investigation. The blood Wassermann was negative.

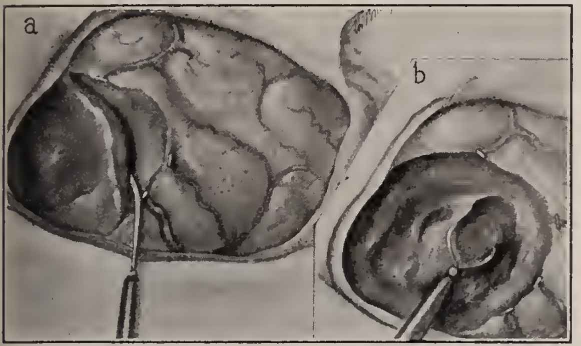

Fig. 1. Shows tumor at time of operation. a. Tumor mass with cortical extension. b. Use of electrified loop to "scallop" out tumor.

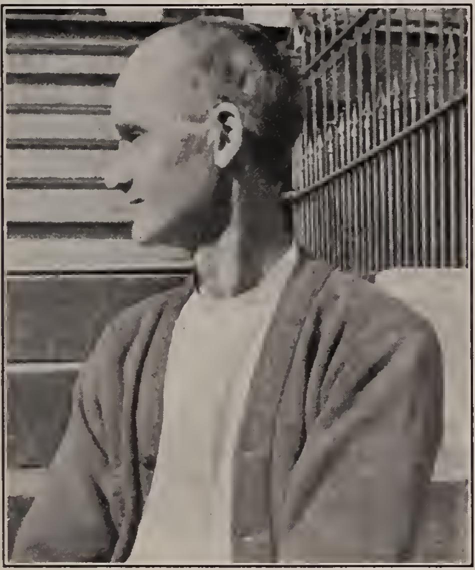

Fig. 2. Photograph taken four months following operation.

Examination of the cerebrospinal fluid, patient lying quietly on the side, showed pressure of 42 mm. of mercury; clear fluid, cell count 14; nonne faint trace, and Wassermann negative. General physical examination and other clinical investigations revealed no other pathology.

*Preoperative diagnosis*: Brain tumor, infiltrating, probably in the left occipitoparietal lobe.

It seemed that we were dealing with a lesion either involving a relatively silent area or subcortical in nature, not invading the motor or speech area but relatively close thereto. The history of transient anomia, right homonymous hemianopsia and weakness of the right arm indicated the probable location of the tumor. There was some doubt as to its exact location and accordingly the patient was prepared for a direct puncture of the left ventricle on the presumption that, if the ventricle was collapsed, the lesion must of necessity be in the left hemisphere above the tentorium and posterior to the motor area.

*Operation*: On August 23 a single trephine opening was made over the left occipital pole and attempt made to tap the ventricle. This did not meet with success and the conclusion was reached that the left posterior horn was collapsed. This confirmatory evidence seemed to justify a left osteoplastic flap operation over the parieto-occipital region. The usual technic was followed.

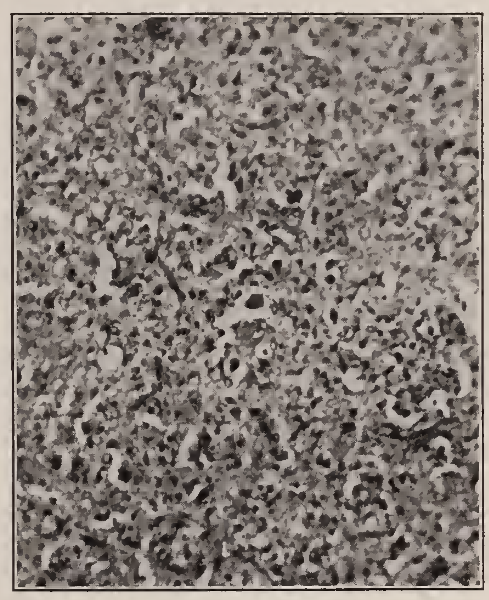

Fig. 3. Photomicrograph of section from tumor.

A flap was turned down, revealing marked increase in the intracranial pressure. The bone over the posterior parietal region was extremely thin. A small opening was made in the dura and again a ventricular tap was attempted. This was unrewarded. The dura was opened widely, exposing a flattened cortex with a cortical infiltrating, brownish-red tumor lying in the posterior parietal and occipital lobes, slightly inferior to the posterior extremity of the Sylvian fissure. With the electrosurgical knife and loop the tumor was enucleated in "scallops." A mass, the aggregate size of a pullet egg, was scooped out until normal cerebral substance was encountered. The dura was closed and the flap replaced (fig. 1).

Patient made an uneventful recovery and was discharged from the hospital, walking, on September 25. The discs at that time showed a marked recedence and the physiologic cups were present on both sides. The margins of the discs were clear. There was a slight residual weakness of the right hand. No headaches or other complaints (fig. 2).

*Pathologic report* by Dr. V. Cefalu, Providence Hospital Department of Pathology.

Gross findings. Irregular pieces and strips of tissue of color, varying from white and gray of brain substance to areas of pinkish gray. The latter are fairly firm, fairly well demarcated from brain substance and grossly tumor. Frozen section shows cellular tumor.

Microscopic findings. The tumor is rather highly cellular. The cells are loosely packed, and follow no definite arrangement. The predominant element is a large oval or slightly fusiform cell, having a nucleus of moderate size, showing frequent evidence of mitosis. Cytoplasm is of moderate amount, and there is considerable intercellular substance. Frequent areas of degeneration are seen, with vacuolization and hemorrhage. Scattered multinucleated giant cells are present in small numbers. Occasional large cell, with vacuolar nucleus and hyperchromatic nuclei, corresponding closely to neuroblasts, are seen (fig. 3).

*Pathologic diagnosis*: Glioma, spongioblastoma multiforme.

### CONCLUSIONS

Report of a case of spongioblastoma multiforme with operation and apparently normal health for seven months.

The diagnosis of infiltrating glioma does not necessarily mean a hopeless prognosis.

Early diagnosis and exact localization with complete enucleation using the electrosurgical knife and loop is the only treatment.

Radiation of spongioblastoma multiforme may be harmful in many instances producing interstitial hemorrhage and acute edema.*

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* NOTE. Seven months after operation the patient shows normal eyegrounds and no symptoms of former condition.

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# UNUSUAL COMPLICATIONS OF MASTOIDITIS *

CLARENCE W. SHANNON, M.D.
SEATTLE, WASH.

The following two cases bring out the frequency of extension of infection through the lateral sinus plate in acute mastoiditis in children, as well as a more favorable prognosis than is usually expected in the adult case.

### CAVERNOUS SINUS THROMBOPHLEBITIS

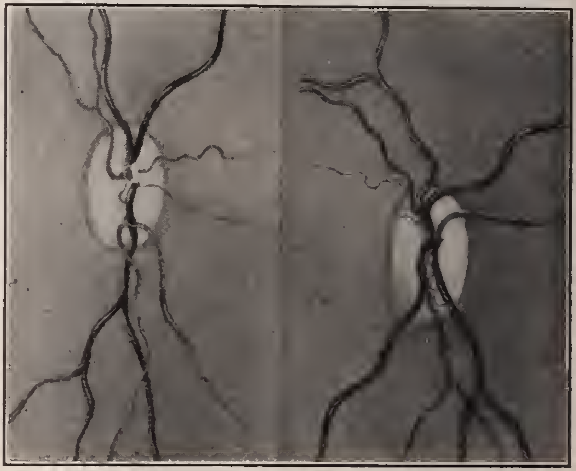
Case 1. It is rare to make a diagnosis of cavernous sinus thrombosis outside the postmortem findings, as the possibility of recovery is very remote. Nevertheless, this case showed sufficient signs and symptoms to consider it in that class, the route of infection presumably following the lateral sinus or branching off into the superior petrosal sinus from the mastoid. The severity of the infection was marked from the beginning but the localization showed a predilection for the venous canals early in the rapid course of development. No specific therapy was used and recovery occurred rather suddenly after second transfusion.

The patient entered the Orthopedic Hospital on January 14, 1929, with history of slight attack of influenza two weeks previously, followed later by acute otitis media with mastoiditis.

Examination showed a very sick boy, age 5½ years, complaining of earache, soreness in neck and throat, temperature of 103°, swelling over mastoid extending over zygomatic and preauricular regions. The right ear was negative, throat red and tonsils inflamed. Respiration twenty, many coarse rales found in subscapular area but no pneumonia present, even after anesthesia for mastoidectomy. The urinalysis was negative except for slight irritation of kidneys that would be expected. Blood count: reds, 4,000,000, 32,000 leukocytes, 95 per cent polys (this dropped to 18,000 a few days after operation).

Because of slight rigidity of neck and stupor, a lumbar puncture was done before opening mastoid. It was negative. Smears from mastoid cavity showed a staphyloccocic growth. On removing the cortex a diplococcic type was found. The mastoid cavity was filled with diseased cells and granulations of serosanguinous infection. Antrum was opened wide, all cells uncapped, tip removed but no sinus or dura exposed.

The convalescence was stormy, with considerable respiratory difficulty, regurgitation of fluids, the left eyelid becoming red and swollen shut with partial paralysis of face on same side. The swelling extended over paratid and submaxillary region which became painful to touch. The next day the pack was removed and mercurochrome applied in posterior wound. The edematous area of eyes and frontal sinus increased, closing eye completely. The movement of eyes was limited, with partial dilatation of pupil, chemosis. The fundus veins showed congestion with increase in normal ratio of arteries; slight proptosis of globe, cornea insensitive. Subcutaneous hemorrhage developed in right lid (fig. 1).



a. b.

Fig. 1, a. Left eye normal. b. Right eye shows obliteration of cup and bulging of vessels on nasal side above and below. There is dilatation of veins, showing increase of venous pressure.

Transfusion from mother of 250 c.c. was given with very little change except the cellulitis started in upper left lid, involving lower lid sufficiently to close left eye. Patient was delirious and very restless (fig. 2, a). Roentgenogram of sinuses showed no frontal infection, ethmoids and antra clear. Considerable discharge from nose. Patient was barely able to take fluids by mouth. Very little urine was passed but urologic consultant reported no evidence of secondary renal infection. Blood cultures were negative. Glucose and fluids increased by proctolysis and hypodermically. Smears for Vincent and throat culture negative. Von Pirquet and Minot negative. The mastoid wound was clean and healing in spite of cellulitis. The cellulitis became mottled and almost cadavaric in appearance.

Second transfusion of 250 c.c. resulted in signs of improvement. Child began to perspire freely and to talk in its sleep. The respirations were wheezy in character, the pulse became more perceptible and could be counted at about 140. The swelling on right side began to subside. Ptosis of lid persisted but patient was able to take fluids by mouth. Although chest still threatened pnuemonia, color of face was more of a purple, with general cyanosis at intervals. Large doses of digitalis improved condition. Involuntary movements of bowels and bladder. The right eye was still very red. Swelling in joints, in right arm and left leg were marked.

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* Reported at Meeting of Seattle Pediatric Society, Seattle, Wash., Oct., 1929.

The temperature dropped gradually from 103° to 100° or less. The apex beat was over to left and down to sixth interspace. The day after the second transfusion child took interest in things and improved rapidly, leaving hospital on Feb. 14, one month after entrance. Rales disappeared from chest on Feb. 2 (fig. 2, b).

There was an undoubted cellulitis, simulating erysipelas but the seat of infection was too general and deep seated to account for other symptoms. There was no pus formation in cellular tissues at any time.

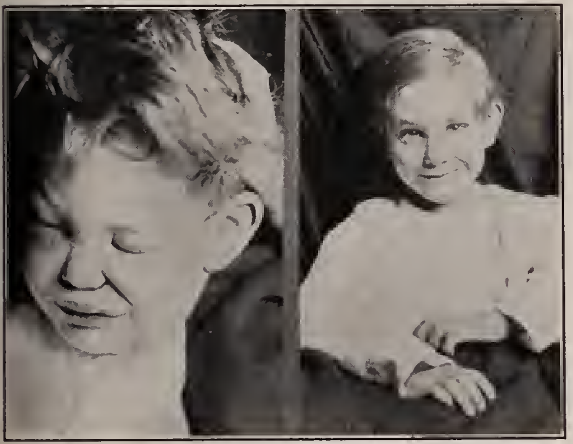
a. b.

Fig. 2, a. Two days after operation. Shows cellulitis of both upper lids, partial facial paralysis of right side. Semiunconscious. b. Appearance of patient one month later.

The picture ran a course suspicious of pneumonia at times, but no consolidation or other sufficient physical signs could be discovered to make a diagnosis. Mikulicz's disease might have been suspected but there was no actual hypertrophy of any of the lymphatic glands. The acute course and blood picture showed no resemblance to any type of leukemia. The recovery was complete.

### MENINGITIS

Case 2. A very sick boy entered clinic with temperature of 104°, presenting acute purulent otitis media and mastoiditis. There was a history of cold and influenza recently, followed by pain in left ear. The tympanum was incised at home but continued discharging under irrigations for over a week before admission.

He gave history of pain in the other ear several weeks preceding but this cleared up without treatment. On entrance the boy showed a fairly thick but not profuse discharge with slightly collapsed and tortuous canal, drum perforation of fair size, no pulsation, no vertigo or nystagmus, no swelling or tenderness over cortex.

Nose: Normal appearance and sinuses negative on transillumination.

Throat: Tonsils present and thick postpharyngeal wall secretion present.

Heart: Rapid but regular. No rales or impaired sounds. Eye grounds negative.

Admitted and operated on November 23, 1929. The cortex was thin but there was no perforation. The mastoid cavity was full of diseased granulations with free pus from region of tip, considerable involvement of zygomatic region. Antrum was deep and well opened, with uncapping of all cells. Smear sent to laboratory. No sinus or dura exposed. Dakin tube inserted and wound closed.

Patient reacted well and was comfortable, but had a chill and temperature rose to 105°. Blood culture was positive for hemolytic streptococcus. The jugular vein and facial branch were ligated Nov. 28. Dural covering incised with free bleeding from both ends, also from emmissary. Sinus packed with iodoform plugs and wound partly closed.

Next day the right cheek was swollen and there was pain in back. Temperature registered 105° to 99°, but never caught below 99°. Packing removed from sinus with free bleeding, repacked. Lumbar puncture. Vomiting and nausea. No discharge or bleeding from posterior wound. Acute endocarditis present.

Spinal fluid was under slight pressure with flocculent precipitate, no stiffness of neck. The urine was negative before and after operations. The smear and culture showed streptococcus on forty-eight hours cultivation (25 colonies). Blood count: r.b.c., 4,500,000; w.b.c., 12,000 to 20,000; polys, 73 to 63 per cent, which was low for meningitis. Wassermann negative.

Pain in back and vomiting of projectile type persisted but culture from spinal fluid was negative until ten days after operation (fig. 3).

| Date | Spinal fluid | Cell count | Medication | Cultivation |
|---|---|---|---|---|
| Dec. 8 | Turbid | 830 | Urotropine | Positive for strep |
| 10 | " | 2,400 | " | Negative |
| 11 | Cloudy | 42,000 | " | " |
| 12 | " | 8,000 | " | " |
| 13 | " | 1,570 | " | " |
| 15 | Turbid | 4,240 | " | Positive for strep. |
| 16 | " | 1,250 | " | " |
| 17 | Cloudy | 220 | " | Negative 24 hours |
| 18 | Clear | 90 | " | " |
| 19 | Cloudy | 410 | " | Strep.(Globin++<br>(Fehling+ |
| 20 | Clear | 200 | " | Negative |
| 21 | " | 74 | " | " |
| 23 | " | 100 | " | " |
| 24 | " | 66 | Discon't'd | " |
| 26 | " | 60 | " | " |
| 27 | " | 7 | " | " |

Fig. 3.

Urotropine was used after each drainage. Whether it or the daily spinal drainage was more important in clearing up the meningitis could not be determined as we have had no occasion to check up, but the child weathered the infection without any other complications.

## LATERAL SINUS INFECTION AND SYMPATHETIC MENINGITIS *

V. W. Spickard, M.D.
SEATTLE, WASH.

### CASE REPORT

Girl, eight years of age.

Past history. Has had appendicitis. Otitis media several times. Tonsils removed five years ago.

Present illness. Cold and acute pharyngitis began December 24, 1929. Fever for two days, then temperature subsided.

Dec. 28. Recurrence of fever 104.2°. Right ear drum was bulging and was incised.

Dec. 29. Profuse serous discharge from the ear. Urine showed considerable pus. Fever ranged from 101°-104°. Hexamethylenamin was given.

Dec. 31. Discharge from ear still profuse and watery. Temperature 100°-102°. Last two days complains of headache intermittently.

Jan. 3. Fever subsiding. Ear discharge less. Urine clear.

Jan. 5. After twenty-four hours normal temperature fever rose in evening to 105.2°, and she was taken to hospital. Ear still discharging seropurulent exudate. No mastoid tenderness or swelling. No stiffness of neck. No Kernig.

Jan. 6. Temperature 103° in a.m. Slight stiffness of neck. Slight Kernig.

Spinal puncture. Removed 32 c.c. Milky appearing fluid withdrawn showing a cell count 22,500. Nonne positive. No bacteria found. Blood count. Hbg. 44 per cent; r.b.c. 3,450,000; w.b.c. 10,200; polys 72 per cent. Roentgenogram of mastoids. Right slightly cloudy. Smear from ear showed long chain streptococci; culture same in twenty-four hours.

Mastoidectomy by Dr. Chase. Lateral sinus not uncovered. Few necrotic cells found. Spinal puncture gave 50 c.c. fluid withdrawn. Cell count still high but not accurate because the fluid had stood.

Jan. 8. Temperature still ranges from 100° to 105° during twenty-four hours. Child bright. Slight stiffness of neck and slight Kernig. Spinal fluid: 35 c.c. withdrawn and 15 c.c. antimeningococcus serum given. Cell count 5,977. No bacteria. Serum gave no growth. Blood culture negative.

Jan. 9. Still has daily rise of fever. Spinal puncture of 30 c.c. fluid. 15 c.c. serum given. Cell count 795. Blood count, Hbg. 42 per cent; r.b.c. 2,900,000; w.b.c. 6,700; polys 80 per cent. Child appears to be in good condition. Lateral sinus thrombosis suspected.

Jan. 10. Transfusion of 300 c.c. Chill after. Fever continues with same daily rise.

Jan. 11. Blood. Hbg. 50 per cent; r.b.c. 3,130,000; w.b.c. 6,700; polys 90 per cent.

Jan. 12. Fever above 105°. Stiffness of neck. Positive Kernig. Positive Babinski, right side. Marked ankle clonus of both sides. Knee jerks exaggerated. This is a change in symptoms.

Spinal fluid, 40 c.c. Cell count 333; 90 per cent polys; w.b.c. 6,000.

Jan. 13. Still has slightly exaggerated knee jerks and Babinski. Hbg. 45. Operation. Lateral sinus opened and packed. Not completely thrombosed. Right internal jugular tied off.

Jan. 14. No rise in fever. No meningeal symptoms. Clonus present. Babinski negative. Knee jerks normal. Blood: Hbg. 36 per cent; r.b.c. 2,430,000; w.b.c. 6,200; polys 71 per cent.

Jan. 15. Transfusion of 210 c.c. Fever 99°-101°.

Jan. 16. Hbg. 38 per cent; r.b.c. 3,150,000.

Jan. 17. Hbg. 40 per cent; r.b.c. 3,350,000; w.b.c. 6,400; polys 69 per cent.

Jan. 20. Has continued to improve. No meningeal symptoms or abnormal reflexes. Transfusion of 200 c.c.

Jan. 20. Blood: Hbg. 67 per cent; r.b.c. 3,940,000; w.b.c. 6,400; polys 73 per cent.

Jan. 24. Has continued to improve. Last two days has had tenderness of shoulders and wrist joints. Salicylates given. Had rise of fever to 103° last night.

Feb. 15. Has completely recovered.

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* Read before Annual Meeting of North Pacific Pediatric Society, Seattle, Wash., Jan. 25, 1930.

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## ROUTINE COMPLEMENTARY FEEDING OF THE NEWBORN *

J. E. Toothaker, M.D.
CENTRALIA, WASH.

The routine complementary feeding of the newborn is a departure from the hard and fast rules laid down for us by our textbooks on pediatrics. It has been practiced by grandmothers and midwives in giving of sugar water to the newborn, but had not been scientifically and systematically carried out until the last few years, when it was put into practice in nurseries of some of the larger hospitals under the supervision of such men as Shick at Columbia University, Herman of New York, Royster of the University of Virginia Hospital and Neff[1] of Kansas City, who has reported a larger group of cases than any of the aforementioned.

During the last three years the routine complementary feeding of the newborn has been put into effect in the nursery of the Sweet Clinic and Hospital. One hundred unselected cases have been charted and compared with one hundred unselected cases, in which the infant did not receive such feedings (charts 1 and 2).

These findings show that of the one hundred not receiving the complementary feedings sixty-eight left the hospital at a twelve-fourteen day period, having regained or exceeded their birth weights and thirty-two failed to regain their birth weights at this time. The average maximum loss of the sixty-eight regaining their birth weights was 9.8 ounces, which occurred on the 3.7 day. These regained their birth weights on an average of the 9.7 day and left the hospital with an average gain of four and one-half ounces over their birth weights. The

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* From Sweet Clinic.

[1] Neff, Franck C.: Feeding Care in the Newborn. Am. J. Dis. Child., Vol. 34, p. 870, 1927.

CHART 1.

100 CASES RECEIVING ROUTINE COMPLEMENTARY FEEDINGS

CASES NOT REGAINING BIRTH WEIGHT IN 12-14 DAY PERIOD

| Weight in pounds | Number | Maximum loss | Day of maximum loss |
|---|---|---|---|
| 5 | 1 | 7.6 | 4.0 |
| 6 | 3 | 11.3 | 4.0 |
| 7 | 6 | 11.0 | 4.6 |
| 8 | 5 | 12.0 | 4.6 |
| 9 | 2 | 10.8 | 4.0 |
| 10 | 1 | 10.0 | 6.0 |
| 11 | 0 | 0.0 | 0.0 |
| Total and averages | 18 | 10.4 | 4.5 |

CASES REGAINING BIRTH WEIGHT IN 12-14 DAY PERIOD

| Weight in pounds | Number | Maximum loss | Day of maximum loss | Day of regaining birth weight |
|---|---|---|---|---|
| 5 | 1 | 5.0 | 2.5 | 8.0 |
| 6 | 18 | 6.0 | 2.3 | 7.2 |
| 7 | 31 | 6.8 | 2.4 | 6.4 |
| 8 | 18 | 7.2 | 2.4 | 7.6 |
| 9 | 8 | 9.4 | 2.2 | 7.1 |
| 10 | 5 | 7.0 | 3.2 | 7.8 |
| 11 | 1 | 11.0 | 4.4 | 10.0 |
| Total and averages | 82 | 7.6 | 2.7 | 7.7 |

CHART 2.

100 CASES NOT RECEIVING ROUTINE COMPLEMENTARY FEEDINGS

CASES NOT REGAINING BIRTH WEIGHT IN 12-14 DAY PERIOD

| Weight in pounds | Number | Maximum loss | Day of maximum loss |
|---|---|---|---|
| 5 | 0 | 0.0 | 0.0 |
| 6 | 6 | 7.5 | 3.75 |
| 7 | 10 | 11.6 | 5.0 |
| 8 | 11 | 14.8 | 4.8 |
| 9 | 3 | 16.0 | 3.0 |
| 10 | 2 | 14.0 | 6.0 |
| Total and averages | 32 | 12.6 | 4.5 |

CASES REGAINING BIRTH WEIGHT IN 12-14 DAY PERIOD

| Weight in pounds | Number | Maximum loss | Day of maximum loss | Day of regaining birth weight |
|---|---|---|---|---|
| 5 | 8 | 6.9 | 3.5 | 9.2 |
| 6 | 16 | 6.7 | 3.0 | 9.2 |
| 7 | 24 | 8.5 | 3.6 | 9.75 |
| 8 | 15 | 12.2 | 3.7 | 10.2 |
| 9 | 3 | 10.0 | 5.0 | 12.3 |
| 10 | 2 | 12.0 | 5.0 | 9.0 |
| Total and averages | 68 | 9.8 | 3.7 | 9.8 |

average maximum loss of the thirty-two not regaining their birth weight was 12.6 ounces, which occurred on the 4.5 day. They lacked on an average of 5.2 ounces of regaining their birth weight.

There were eleven cases of inanition fever. Seventy-two left the hospital on breast feedings only, twenty-four on mixed feedings and four on the bottle alone.

Of the one hundred cases receiving routine complementary feedings, eighty-two left the hospital at the twelve-fourteen day period, having regained or exceeded their birth weights and only eighteen had failed to do this. The average maximum loss of the eighty-two regaining their birth weights was 7.6 ounces, which occurred on the 2.7 day. They regained their birth weights on an average of the 7.7 day and left the hospital with an average gain of six and one-fourth ounces over their birth weights.

The average maximum loss of the eighteen not regaining their birth weights was 10.4 ounces which occurred on the 4.5 day. These infants were only on an average four ounces under their birth weights when they left the hospital. There were two cases of inanition fever. Eighty-eight left the hospital on breast feedings only, twelve on mixed feedings and not any on the bottle. These figures tally closely with those cited by Neff[1] in a report given to the American Pediatric Society in 1927.

The average percentage of gain is highest in the six and seven pound groups which is in accord with the usual percentage gain cited in the textbooks. The physiologic loss of weight needs no comment except it is obviously unavoidable and probably beneficial as regards the stimulation of nursing by hunger, providing the loss is not so great as to weaken the infant to such an extent that it cannot nurse vigorously enough to stimulate the breast to its proper function. Additional feeding the first days strengthens the infant, so it is better able to empty the breast than the weak starving newborn.

As a complementary feeding we have used two food feedings, one a 10 per cent dark Karo syrup with a caloric value of twelve to the ounce and an acid milk with a caloric value of twenty to the ounce. The infants have not been separated in this report according to the type of complementary feedings.

These feedings are started six hours after birth and kept up at regular four hour periods to and through the time that the normal physiologic loss of weight has occurred and a steady progressive increase in weight begins. This usually occurs from the second to fifth day, at which time we find by weighing the infants before and after nursing that they are obtaining enough breast milk to supply their needs. This routine feeding the first few days of life has not interfered with the breast feeding. If it was thought that the infant showed a greater desire for the bottle than the breast, the bottle was discontinued, but the feeding was kept up with a medicine dropper.

This method reduced the cases of inanition fever from 11 per cent in those not receiving the routine complementary feedings to 2 per cent in those who did receive such feedings. The 11 per cent checks closely with the report of Adair and Stewart,[2] in which they give an average of 12.2 per cent for those infants receiving only breast milk and 4.4 per cent for those receiving complementary feedings. Infants having a temperature above 100° were considered to have inanition fever, pneumonia, pyelitis, otitis media, cerebral hemorrhage and diarrhea particularly having been excluded. This reduction of the number of cases of inanition fever is of particular advantage in reducing infant mortality, as pneumonia and pyelitis develop very rapidly in these infants weakened and starving and the outcome is usually a fatality.

The supply of breast milk is closely watched, for it is paramount to the welfare of the baby. Some mothers coming to full term have demonstrable evidences of colostrum before the baby is born and it is not uncommon to see milk escaping from the nipples during labor. In several cases we have been able to obtain from one to four ounces from the breast the first twenty-four hours, but in most cases it is not until the third to fifth day that sufficient milk for the baby's needs is present.

From our records we know that the normal infant will empty the breast in a five to ten minute nursing period. At the end of each nursing period the breasts are stripped by manual expression. This practice apparently increases the supply of milk and also makes the mother's condition more tolerable. We also use De Buys'[3] procedure of strapping the breasts during the period of engorgement, which definitely reduces the mother's discomfort and also tends to lessen the number of cases of fissured nipples, due to the fact that no pressure is brought on them, as when the usual breast binder is used. This added comfort and freedom from the worry and pain of sore nipples adds greatly to the peace of the mother. She being comfortable and at ease, we are more sure of an adequate supply of milk.

### CONCLUSIONS

Routine complementary feeding of the newborn has the following advantages:

1. The maximum physiologic loss of weight is not so great and the regaining of the birth weight occurs at an earlier period.

2. The number of cases of inanition fever is strikingly reduced.

3. A larger percentage of infants leave the hospital receiving only breast milk.

These advantages without any disadvantages make the routine complementary feeding of the newborn a safe and advisable procedure.

## TETANY AND KINDRED CONDITIONS *

Arthur E. Wade, M.D.

seattle, wash.

Every locality has its seasonal diseases, some infectious, and others a deficiency in etiology. The Puget Sound region has among others the seasona deficiency diseases, due to our long period of absence of the ultraviolet rays of the sun, which precludes any activation of the skin ergosterol, tha vital function of creating a vitamine D within our bodies.

As we now understand, vitamine D is chiefl a vitamine that regulates the calcium and phosphorous balance in the blood serum. It has lon been administered in the medium of cod liver oi to maintain or regain the normal blood phosphorous in preventing or curing of rickets. Althoug originally sought for in cod liver oil, it is now obtained through the irradiation of ergosterol by th ultraviolet rays. The commercial vitamine D obtained in this way is called viosterol. Whether ergosterol is irradiated by the summer sun or by th ultraviolet lamp and then ingested, or the ergostero of the skin is irradiated in either way and the absorbed into the blood, the effect is the same namely, vitamine D is provided to carry on it mission of maintaining a normal blood calcium an phosphorous.

The seasonal deficiency diseases or conditions referred to in the title of this paper, are certai diseases or conditions found prevailing in the lat winter or spring months, the period of the yea when vitamine D is not formed within our bodie by the action of the ultraviolet rays of the su This reduction of vitamine D brings about eithe a normal calcium and low phosphorous balance o a low calcium and normal phosphorous balanc It is the low calcium balance that interests us i tetany and kindred conditions.

A vast amount of study has been done by ou biochemists in the field of calcium metabolism and, while the more elemental details are agreed upon by all, there is a great difference of opinion among them as to the more obscure details. One reads with avidity the theories of calcium action upon the neuromuscular structures, then with equal interest he reads of the theories of parathyroid hormone action upon the presence and concentration of guanidin, the only drug which, when administered, can produce the symptom-complex we know as tetany. Many biochemists hold to the former and others to the latter. All agree to certain fundamental conceptions that vitamine D stimulates the parathyroids to greater hormone production, and, in thinking of vitamine D in its calcium or guanidin regulating power, we must think in terms of parathyroid.

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[2] Adair and Stewart: Fever in the Newborn. Am. J. Dis. Child., Vol. 31, p. 846, June, 1926.

[3] De Buys, L. R.: Simple Dressing for Breasts of Mother of the Newborn. Am. J. Dis. Child., Vol. 33, p. 732.

* Read before King County Medical Society, Seattl Wash., Feb. 24, 1930.

With our late winter deficiency of vitamine D we have in many children and adults a deficiency in parathyroid activity. As a consequence of this, we find in certain individuals a varyingly reduced blood calcium. Nearly all of the blood calcium is found in the blood serum, normally present in the amount of 10 to 11 milligrams per 100 c.c. of whole blood. When the blood calcium falls to below 5 milligrams per 100 c.c., active tetany ensues. Active tetany is spectacular in its manifestations of tonic convulsions, usually of the carpopedal type, displaying the obstetrician's hand and the talipes-equino-varus foot contractures which hold for hours or days.

If the blood calcium falls to between 9 and 6 milligrams per 100 c.c., latent tetany exists, demonstrable only by the altered electric reactions, the Chvostek and Trusseau signs. The patient with latent tetany is only awaiting some additional contributing cause for the precipitation of a transient tetany. In the theory of Howland and Marriott this additional cause is alkalosis. In the theory of Noel Patou it is the excessive presence of guanidin. As the theory of Howland and Marriott is supported by chemical results in treatment, it is well to hold to it in our present conception, for it leads to understanding in treatment and certainly points the way to rapid relief of symptoms.

Nearly all of the blood calcium is found in the blood serum held bound in protein or united to the various anions present. The calcium held in solution with anions is mostly soluble phosphates, linked in some way to a parathyroid body-complex. Being electrolites, these salts dissociate, liberating calcium ions in inverse proportion to the alkalinity of the blood; thus the greater the alkalinity, the less the ionization, the less the alkalinity, the greater the ionization. It is the concentration of ionized calcium that determines the efficiency of its physiologic action upon the neuromuscular structures. Consequently when the ionized calcium is diminished by alkalosis, its sedative action must be less and the nerve impulses strike the muscles without the calcium inhibiting function and the muscles are thrown into excessive contractions. These contractions if tonic are those of tetany (fig. 1).

We may consider, then, that diminished total blood calcium would furnish less calcium for ionization, and that ionized calcium is the end-form which determines the degree of muscle spasm inhibition. We may deduce the following.

Tetany may be precipitated by (1) very low blood calcium with normal blood pH, (2) moderately low blood calcium with moderate alkalosis, (3) slightly low blood calcium with marked alkalosis, (4) and perhaps normal blood calcium with extreme alkalosis. The cause of low calcium has been attributed to hypoparathyroidism caused by vitamine D deficiency.

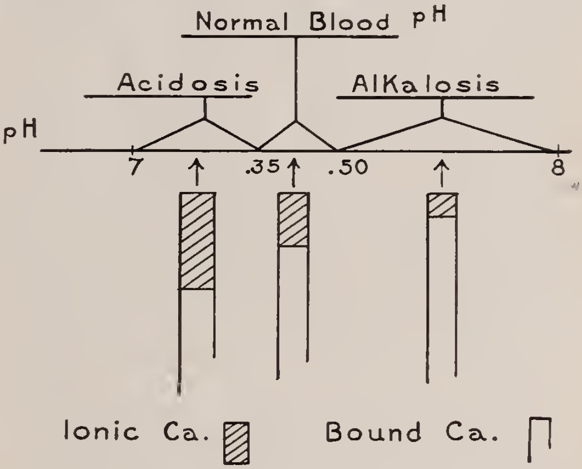

Fig. 1.

The cause of alkalosis may be any of the processes of abnormal physiology which produces an electrolite balance in the blood, presenting an excess of base over acid greater than is normal. Three causes may be mentioned.

1. Hyperventilation of the lungs from excessive breathing during crying, excitement, hysteria or from stimulation of respiration at the onset of an infectious disease. In this act excessive $CO_2$ is blown off through the lungs, reducing the hydrogen ion or acid radicles of the blood, while the base, sodium, is retained.

2. Excessive vomiting, if hydrochloric acid is

present in the vomitus. In this act the chlorine of the sodium chloride is ejected, reducing the acid radicles of the blood, while the base, sodium, is retained.

3. Excessive ingestion of sodium bicarbonate or other alkalies, taken so much by the laity in unintelligent faith, or prescribed to excess under conditions where the patient is not under due surveillance. In this act the total blood sodium bicarbonate is in excess, the $CO_2$ escapes to some extent through the lung and the base is retained.

Thus are three common causes frequently met which produce a blood pH of greater than the normal 7.35 or 7.5 and consequently a diminished ionic calcium balance. In this balance, if the total blood calcium is already low, tetany may follow. If tetany does not occur, then a condition exists of potential or latent tetany, sometimes called spasmophilia, a condition where a sudden tipping of the scales toward a transiently greater alkalosis would precipitate a convulsion or perhaps an intermittent spasticity.

In this balance, where conditions are not great enough to produce a true tetany, come the disorders kindred to it. All diseases accompanied by spasms, cramps and convulsions are those with symptoms kindred to the tetany complex, if their spasms, cramps and convulsions are of the distal, neuromuscular type and not of the upper neuron type, and theoretically should be more frequently found in late winter and spring, displaying greater muscle disturbances than in other periods of the year.

It is true that tetany and latent tetany are seasonal. It is also true that chorea, tic, hiccough, severe whooping cough and infant breath holding are of the same seasonal types. It is fairly well proven that exacerbations in chronic spastic colitis are specifically noted to be worse at this time of year, and it may be submitted for consideration, are not all muscles, hypersensitive to stimulation by reason of a low blood ionic calcium, more responsive to stimulation from the upper neuron when the brain and meninges are responsible for spasms, convulsions and spasticities.

Treatment, prophylactic and therapeutic, resolves itself to the chemistry of the blood plasm. Bromides, chloral hydrate, luminal and other cerebral depressants are of no avail. The altered blood reaction and low calcium must be corrected. To accomplish the former, the alkalosis should be converted to a mild acidosis by 4 to 6 gram doses of $NH_3Cl$ daily for a two year old child, gradually reduced as symptoms abate. To accomplish the latter, parathyroid in properly selected doses repeated once or twice at twelve to eighteen hour intervals if needed. Parathyroid hormone will raise blood calcium at any cost, even to the depleting of bone tissue. Consequently it is well to provide within the intestinal tract available calcium either as contained in milk or as administered in lactated calcium or calcium chloride. During the period in which the parenterally administered parathyroid hormone is functioning, viosterol should be given in full doses to stimulate the patient's parathyroid in carrying on independently. With normal blood calcium regained and any cause for extreme alkalosis removed, tetany and spasmophilia are banished.

If any hypodermic sedative is needed, 25 per cent magnesium sulphate solution may be given in 2 to 4 c.c. for a two year old child. Older patients may need small morphine doses added to the magnesium sulphate to relieve apprehension and to depress respiration, thus conserving $CO_2$. Theoretically administration of $CO_2$ would relieve alkalosis until such time as the ammonium chloride could accomplish its blood pH effect.

### COMMENT

Convulsions and spasms are caused either by a central or upper neuron hyperstimulation from disturbed physiology of the brain or meninges, or by a peripheral neuromuscular disturbance of physiology. Cerebral sedatives would naturally be expected to give relief to the former but not to the latter.

Tetany is the spectacular example of complete and persisting spasm from the peripheral disturbances, due to low ionic calcium.

Spasms and convulsions kindred to tetany are those of the same but lesser etiology and appear only when precipitated by contributing illnesses or alkaloses.

An incomplete list may include breath holding of infants, laryngospasm, intestinal colic, chorea, tic, spastic colitis, cramps in various muscles, and perhaps increased spasticity in all chronic spastic paralyses.

Tetany and kindred conditions are relieved by converting alkalosis to acidosis and raising the blood calcium.

Spasms and convulsions in the presence of acidosis are not tetany in type but of upper neuron origin.

Medical-Dental Building.

# PYLOROSPASM OF INFANTS

## A TENTATIVE METHOD FOR CONTROL OF THE VOMITING *

D. M. Dayton, M.D.
TACOMA, WASH.

After observing good results from the use of phenobarbital in controlling the vomiting of infants and children due to various causes, an attempt was made in a similar manner to treat babies having symptoms commonly present in pyloric stenosis. The cases here reported were clinically indistinguishable from those coming to operation for an actual stenosis of the pylorus, but since cases recovering under medical care are usually considered due to pylorospasm, it is probable that these should be similarly classified.

Tisdall, Poole and Brown† believe pylorospasm is merely part of a general hypertonia. The cases here reported were not hypertonic, but it is probable hypertonia may result from an alkalosis following persistent vomiting from any cause. Symptoms of hypertonia are promptly relieved by adequate doses of barbital.

My experience with this method is too limited to warrant definite conclusions, but results were so good that it is believed a considerable percentage of these cases will respond. This method is not advocated as a substitute for surgery, but it warrants a trial in all cases, since, failing to cure, it will permit rest and an increase in body fluids, preparatory to operation. While several vomiting babies were successfully treated, the following two cases are reported as being typical of this condition. It may be well to emphasize that the drug must be used in relatively large doses, and the mother or nurse instructed to repeat at once, if the dose is vomited.

Case 1. Baby J. H., male, was the first child of young parents. The birth weight was said to have been nine pounds. He was taken from the breast because of vomiting, and several different formulas were used without success.

When first seen September 20, 1929, at two months, his weight was nine pounds and thirteen ounces. He was a very large baby, with a dry wrinkled skin and he appeared and acted starved. The emaciation was great enough to suggest a birth weight above nine pounds. There were definite and marked peristaltic waves in the gastric region; vomiting was forcible and the stools were of the hunger type.

He was given whole lactic acid milk two ounces with Karo syrup, one teaspoonful every two hours. Phenobarbital sodium, 1/6 grain, was given every four hours, with instructions to the mother to continue until the baby was drowsy and to repeat at once if he vomited. Four days later the weight was nine pounds and fifteen ounces. The baby was still vomiting and peristaltic waves were present. After three more days the weight and condition were the same and the dose was increased to ¼ grain every four hours. During the following week the baby vomited intermittently and lost four ounces in weight. He was doing better than before giving the medicine, but definite waves were present.

It was then discovered that the mother had failed to repeat the dose after vomiting occurred. She was again instructed to give ¼ grain of phenobarbital sodium every four hours until the baby was continuously drowsy, emphasizing the importance of repeating the dose immediately, if vomiting occurred. Water was given freely between feedings. If the baby became too drowsy to take the feeding well, the dose was to be omitted.

During the three days following these instructions, the baby gained one pound and two ounces in weight. There was no vomiting. He was comfortably drowsy, but awakened readily. The following week he gained one pound and one ounce. A week later the weight was twelve and one-half pounds, a total gain of two and one-half pounds in seventeen days. The drug was then reduced to ¼ grain, three times daily. The following week there was a gain of nine ounces. There was no vomiting and no visible peristalsis. The barbital was then stopped. He continued to do well, gaining about eight ounces each week and was put on a five ounce feeding of a whole milk formula every four hours which he took without vomiting. He has continued to gain normally.

Case 2. Baby G. B., male. Birth weight seven pounds. Is the first baby of young parents. He vomited a great deal, beginning soon after birth and was taken from the breast. He continued to vomit various formulas and when seen on October 5, 1929, at five weeks, weighed six pounds and five ounces. He looked starved, was restless, pale and wrinkled and had hunger stools. There were marked peristaltic waves over the gastric region and vomiting was forcible.

He was given one and one-half ounces of whole lactic acid milk with added Karo syrup, one teaspoonful every two hours. Water was allowed freely between feedings. Phenobarbital sodium, ¼ grain, was given every four hours, and was to be repeated at once if the baby vomited, until he became constantly drowsy.

Two days later the weight was six pounds and fifteen ounces, a gain of ten ounces. There was little vomiting, but peristaltic waves were present. The following five days the baby gained ten ounces and was taking the drug less frequently. The next week he gained but three ounces, but was found to have a bronchopneumonia, from which he later recovered without loss of weight. During the following month he gained three pounds, using a dose of barbital occasionally. The drug was then stopped.

December 14 the baby had a severe choking spell with cyanosis. A large thymus was discovered by fluoroscopy and roentgen treatments were administered. He is still gaining normally and has no vomiting, without the use of barbital. Peristaltic waves are still occasionally visible.

Case reports of two babies, having symptoms similar to those found in the pyloric stenosis of infancy, are here presented. Treatment by the use of phenobarbital gave such striking results that it is believed it should be given further trial.

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* Read before Annual Meeting of North Pacific Pediatric Society, Seattle, Wash., Jan. 25, 1930.

† Tisdall, Poole and Brown: Am. J. Dis. of Child., Vol. 34, p. 180, Aug., 1927.

# HIGH ACID URINES NOT TRUE ACIDOSIS*

Arthur H. Gray, M.D.
SEATTLE, WASH.

In presenting this paper on high acid urines I wish to report a series of special cases that we have observed for several years in children who have high acid urines, when there is but very little if any other cause for it outside of their diet. Case after case we will examine and say to the parent, "I cannot find anything physically wrong with your child, and so far I am unable to account for such symptoms, so we will do a blood examination and take a specimen of urine." When we find a very high acid urine with nothing else to account for it, I ask the mother to give me an average daily diet for the week. In so doing she invariably begins by saying, "My child won't eat this or that food, craves certain other foods and wants about the same things each day." When the average daily diet for one week is looked over, one can readily see that the child is not on a well balanced diet and such could have a great deal to do with the symptoms and conditions which are found.

I do not wish to discuss true acidosis or many of the conditions which can cause high acid urines other than the diet. On the other hand, I wish to show that these other conditions, which will be discussed as miscellaneous causes of high acid urines, have quite an influence as well as a predisposing cause of this condition. If you persist in feeding foods that act acid during or after digestion, or what are called the acid ash foods, and the proper elimination by the kidneys does not take place, it will gradually reduce the alkalinity of the body and you will get your increased acid urines. High acid urines, then, will mean either the overconsumption of acid ash foods or the underconsumption of the alkaline ash foods.

Blatherwick proved that the acidity of the urine can be changed at will by the proper manipulation of the foods used. Schloss and Harrington lowered the urine of an infant from pH 4.8 to one of 6.3 by adding potato gruel to a diet of proteins. Also a similar result was obtained when an infant was fed with a mixture of dried milk.

It has been shown time and again that children given a vegetarian diet run a low acid urine or even an alkaline urine if on a strict diet, where those on a mixed diet run a higher, and those on a meat diet a still higher acid urine. Increase the protein diet and you increase the urinary acidity by lowering the "ammonia coefficient." Temporary changes in the acid urine may be noted shortly after meals, in some cases to such a marked degree that it may become neutral or alkaline from salts taken with the foods. This change of acidity reaches its lowest point in from two to four hours after food is taken. The acidity appears to be the highest in the morning before breakfast and is diminished after a meal, due to the secretion of hydrochloric acid into the stomach. During the process of normal metabolism considerable amounts of acids are constantly being produced in the body.

Some of the miscellaneous causes of high acid urines are muscular activity, overexercise, fright, anxiety, shock, nervousness and less consumption of fluids, especially water, which are more or less temporary and of short duration as rest and relaxation relieve the situation; anesthesia, major or minor surgical operations, disorders of the alimentary canal, dental caries, diseased tonsils and adenoids, diarrhea, pneumonia, influenza, severe burns, acute infectious diseases, chronic or acute appendix, recurrent vomiting, starvation, especially noticed in newborn babies during the first four or five days with not enough breast milk or fluids. Certain children are more susceptible to this increased acid production than others, especially those that have a high acid condition just previous to anesthesia, surgical operations or any of the above mentioned conditions.

Symptoms of high acid urines are slight at first, as in many cases the onset is so gradual that the usual symptoms are overlooked. This slow onset is more marked when the diet has to do with it than any other condition, as the acid forming or acid ash foods may be just a little in excess of the alkaline ash foods, or has been so slowly increased above the alkaline ash foods that you get a slow forming acid urine. The more common symptoms of this condition are loss of appetite, no gain in weight, cravings for certain foods; the patient is tired and listless, very irritable, nervous, sleeps poorly, sour stomach, headaches in older children. In young children dry skin, skin red and dry about the diaper area, inflammation of vagina and glans penis, pain on voiding urine, regurgitation of sour food. During the earlier stage constipation is the rule, but later you find a loose acid stool, abdominal distress and pain, general abdominal tenderness. The abdominal tenderness and pain may be so marked at times to cause one to suspect appendicitis. The muscular tenderness and pain in the joints are found in severe cases.

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* Read before Annual Meeting of North Pacific Pediatric Society, Seattle, Wash., Jan. 25, 1930.

Compare the above symptoms with those of acidosis. The onset is very rapid and insidious, rapid deep breathing, air hunger, lips and cheeks bright cherry red, extreme restlessness and excitability, vomiting, diarrhea, dehydration, dry skin, anxious and pinched expression of the face, sweet or fruity odor of the breath. There may or may not be high temperature, complete exhaustion, drowsiness and coma.

The diagnosis is made by the finding of an acid urine, varying anywhere from forty to one hundred and ten degrees or more, along with the symptoms as outlined above, where normal urine of children varies from twenty to thirty-five degrees acidity. Urine is normally somewhat acid, having an average pH of about 6.0 with a range of pH 5.0 to 7.0 as the reaction shifts from time to time during the day, depending upon the intake of food. When there is an increase in the acid of the urine, the urine becomes more acid than pH 5-4-3 and so on.

For the determination of average values and for comparison of effects of various forms of diets it is better to make examination of a twenty-four hour specimen of urine. Our regular patients are told to bring specimens with each visit to the office, but with most of them we have to obtain single and fresh specimens in the office and find there is very little variation when the twenty-four hour specimen is properly collected. Henderson and Palmer state that the pH for twenty-four hour specimens of urine varied from 5.1 to 7, where with single specimens it was from 5.0 to 7.4 with normal adult urines. Most of the earlier determinations on infant urines have to be made on single specimens, which for certain types of information it was found to be the better. The urine of normal breast fed infants gave an average pH of 5.5 to 7.2, where the urines of infants on simple milk mixtures gave between 5.1 to 7.0.

Normal urine upon standing, if only for a few hours, may become alkaline, due to fermentation by microorganisms and the liberation of alkaline and ammoniacal radicals. Ammoniacal fermentation may occur in the urine before voiding, due to infection and cystitis. On the other hand, normal urine on standing may become more acid, due to acid fermentation.

As to the question of the collection and preservation of urine samples. We try to tell each patient to have a clean bottle, boiling cork and bottle to be sure. After each voiding empty the specimen into a clean container, preventing it being mixed with bowel motion during any one of the voidings. During the winter months it is not as necessary to use the preservatives as it is during the summer months, since the specimen can be kept cold. Toluene or kerosene is perhaps the best and most practical preservative to use. Simply overlay the urine with a small amount of either one which prevents the growth of bacteria. Use refrigeration or add two to three grains of chloral, ten drops of 4 per cent formaldehyde solution or chloroform five drops to each ounce of urine.

### TEST FOR ACID URINES

Merriott advises the use of bromcresol purple 2 per cent, alcohol solution. A drop or two of this solution is added to a small amount of urine in a test tube. You get a greenish yellow to the acid side of pH 6.0 or purple to the alkaline side. Normal urine may change this indicator either color, but not to a marked degree. The ferric chloride test is made by adding to the urine a 10 per cent solution of ferric chloride equal amounts, or until the color becomes no darker. Unless there are large enough amounts of the acetone bodies in the urine to give a positive ferric chloride test, they may be disregarded. Neither of the above tests will give you the degree of acid in the urine, but are used as indicators of high or low acid urines.

A Tycos urine acidimeter is graduated to read directly the percentage of acidity (n/10 NaOH). This method of determining is convenient, simple and rapid and is accurate enough for comparison in general practice. Fill the tube with urine to the 10 c.c. mark and add two drops of a 1 per cent alcoholic solution of phenolphthalein. Close the tube with the thumb and invert several times to mix contents. Now add decinormal sodium hydroxide solution drop by drop, inverting the tube after each addition until the color has changed to a light rose pink. This makes the acid reaction and you take your reading of the degree of acidity. To determine the total acidity multiply the degree of acidity of a mixed twenty-four hour specimen by the number of c.c. voided. For example, acidity of 30 degrees; amount voided in twenty-four hours 1500 c.c. Total acidity is 30 times 1500, making 45,000. A small amount of acetone bodies in the urine does no harm, but does indicate a derangement of the metabolism, the cause of which should be found out.

### TREATMENT

A well balanced diet, a good variety, no one food or combination of foods over two or three days, plenty of water and fruit juices. Thus you can prevent frequent attacks of high acid urines or in some cases a more or less persistent acid urine. When the urine is highly acid, omit for a time the acid forming foods which are in a general way meats, fish, eggs and bread, certain cereals, prunes, plums and cranberries. Use more of the alkaline forming or alkaline ash foods which are in a general way all fruits (except prunes, plums and cranberries), vegetables, nuts and milk. Give plenty of water and fruit juices, establish a normal bowel condition and you will soon control the situation. With the high acid urines, complicated by some of the miscellaneous causes, diet alone may not control the condition, so you will be forced to use some of the alkaline drugs along with the relief of the miscellaneous causes.

Sansum says, due to the fact that high blood pressure patients usually have very acid urines, the standard treatment for high blood pressure has been alkaline drugs or waters to counteract such abnormal acidities. With the knowledge that food alone might be responsible for abnormally acid urines, it seemed logical to ascertain whether such acid urines might not be corrected by diet alone. After a series of test cases he reported fifty of high blood pressure treated with diet alone and in all the blood pressure fell on an average of forty to fifty points. Only the terminal cases with marked sclerosis of the blood vessels and excessive kidney damage failed to respond satisfactorily.

### CONCLUSION

1. High acid urine does not mean acidosis, nor does an increased excretion of acetone bodies mean a sure sign of acidosis.

2. Diet can control high acid urines, unless there is some other cause or complication.

3. Minor or major operations should not be done, if there is high acid urine.

4. Orange juice should be given after every surgical operation or anesthetic.

5. More fruits and fruit juices in the diet, plenty of vegetables and water.

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# IMPETIGO CONTAGIOSA NEONATORUM

## A PRESENT DAY HOSPITAL NURSERY PROBLEM*

HARRY C. OLMSTED, M.D.
SEATTLE, WASH.

In recent years a contagious skin disease of newborn infants has become prevalent in epidemic and endemic form in many hospital nurseries of this country as well as abroad. This is impetigo contagiosa neonatorum which, on account of its tendency in the newborn to assume the form of bullous lesions, has long been known by the name of pemphigus neonatorum. Outbreaks have been limited almost exclusively to hospitals. It occurs rarely in the practice of home obstetrics, and then usually when some other member of the family or an attendant has provided the source of the infection. According to Reed[1] it is only since 1917 that impetigo has become a real problem in hospital obstetric practice.

Impetigo neonatorum usually makes its appearance in the first or second week of life as small superficial cutaneous papules or papulovesicles, which in the course of a few hours develop rapidly into pustules, blebs or large bullae. Early rupture of the lesions ensues and the resulting shallow ulcers heal in a few days. Meanwhile the surrounding areas of skin have been contaminated, this giving rise to new lesions. The course of the infection in the mild type is largely self-limited, recovery occurring before or soon after discharge of the infant from the nursery.

Repeated bacteriologic studies have determined that a number of pyogenic bacteria are the direct cause of impetigo neonatorum. Of these, staphylococcus aureus is by far the most frequent invader. Staphylococcus albus, streptococci and pneumococci have occasionally been recovered, either alone or in combination.

The identity of the neonatal with the childhood and adult forms of impetigo contagiosa has been proved experimentally by Falls.[2] By inoculation of an adult's skin with material taken from an infant's lesions he produced typical crusted impetigo.

The mode of initial infection in a hospital nursery is not always the same. Authentic instances have been recorded in which infants have been born with the infection, either fully developed or in the stage of retrogression. Living organisms have been recovered from some of these blebs; others were sterile. The mothers of the infected newborns were themselves apparently free from impetigo contagiosa. Kehoe[3] and also Foote[4] report having recovered staphylococci from the lochiae in a considerable proportion of cases.

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* Read before King County Medical Society, Seattle. Wash., Feb. 3, 1930.

The usual cause of an initial outbreak is direct contact between a newborn and a person harboring pyogenic infection in some form. The guilty person may be the mother, the nurse or the physician. Visitors, including children, are often blamed, though I feel unjustly, for their contacts with the infant are rarely intimate enough to furnish a source of infection. The list of disorders responsible for bacterial contamination of the infant's skin includes impetigo contagiosa, furunculosis, paronychia, pustular acne, infected wounds and burns and, according to Reed,[1] paranasal sinusitis. The hands of the doctor or nurse frequently act as intermediate carriers of the germs from another patient to the infant. Benians and Jones[5] traced the cause of one epidemic to a hospital linen sorter suffering from paronychia.

Once introduced into a nursery, impetigo tends to spread in spite of the most prompt isolation measures. Cross infection occurs through the medium of the attendants' hands or the common utensils of the room, such as the bath table, the scales, and soap and olive oil containers. Added factors which favor a multiplication of cases are too warm and moist condition of the infant's skin, such as is brought about by an overheated atmosphere, excessive clothing, and infrequent changing of diapers. Nursery epidemics are most prevalent and severe in hot weather. According to Clegg and Wherry,[6] impetigo is quite the rule among white infants born in the hospitals of Manila. McLeod[7] has reported that adult impetigo assumes the infantile or bullous form during the torrid season in the tropics.

The areas of predilection for impetigo lesions are those especially subjected to moisture, irritation and maceration. Favorite sites are the groins, lower abdomen, axillae, folds of the neck and the occipital and postauricular regions of the scalp. Any irritated and inflamed cutaneous area, such an example as is found in diaper dermatitis, easily becomes secondarily infected by pyogenic organisms. The harsh and quite unnecessary scrubbing and antiseptic treatment which is often applied to the abdomen and thighs preliminary to a circumcision operation is all too frequently followed in a day or two by a so-called "circumcision rash," with subsequent development of impetigo.

As mentioned before, the clinical course of the average case of impetigo neonatorum is mild and self limited. Nevertheless, as emphasized by Rulison[8] and others, the causative bacteria may at any time display increased virulence, as denoted by larger lesions and toxic symptoms. When the blebs occupy a large proportion of the cutaneous surface, the infection is commonly named acute exfoliating dermatitis, and in the newborn this is a highly fatal form of impetigo. Mortality figures of 30 to 44 per cent have been recorded. In some instances the fatalities were due to secondary infection of the umbilical stump and consequent pyemia.

It is thus apparent that the mild character of epidemic and endemic impetigo as ordinarily encountered in hospital nurseries should by no means cause physicians to assume an indifferent attitude toward it. There is always present the danger of a sudden change to increased virulence. Even the continued presence of mild cases in the nursery leads to so much mental distress and dissatisfaction on the part of relatives of the baby that it becomes very embarrassing to the physician and the hospital authorities. The average mother expects to find her newborn baby's skin in perfect condition. To discover that it is marked by ugly appearing pustules and ulcers and the stains of varicolored therapeutic agents is, to say the least, extremely disappointing.

Much added trouble and expense, as well as a considerable decrease in nursery efficiency, are entailed when impetigo has gained a foothold in an institution. The infected infants require the establishment of a separate isolation nursery. In this room, which is often a makeshift, a special detail of nurses must from necessity work under handicap and inadequate supervision. One who has experienced the difficulties in the care of infants during repeated epidemics of nursery impetigo and who has listened to the parents' point of view concerning it, cannot deny that the reputations of both the physician and the institution are harmed by such outbreaks.

In the treatment of impetigo neonatorum prophylaxis is of paramount importance. It is regrettable that in the average American hospital very little has been accomplished in an organized manner toward the prevention of this disease. Impetigo should be considered just as much of a public health problem in the nursery as is measles in the community at large. The supervising nurse of the ward for newborns should be definitely governed by rules for prophylaxis established by a committee of physicians from the hospital staff.

Absolute prevention of nursery impetigo means prevention of the initial case. Attendants must be taught to watch every mother and babe for suspicious appearing cutaneous lesions. The nursery workers themselves must likewise be scrutinized for pyogenic disorders. Very few adult visitors and no children should be allowed to enter the mother's room, and they should be forbidden to handle the infant. It is a wise precaution to require attending physicians to wear a mask, gown and gloves while examining infants in the nursery. Of these I feel that the gloves are the most important.

The discovery of impetigo in a nursery calls for prompt isolation of the infected infants. Here considerable difficulty arises. While it is an easy matter to diagnose correctly the uncomplicated and well developed disease, one has often to decide for or against isolation of an infant displaying other cutaneous irritations, such as heat rash or diaper rash, in which it is suspected that impetigo is developing secondarily. To delay judgment means that possibly in a few hours the infant will be a source of infection to others. On the other hand, if he is placed provisionally with infants suffering from impetigo he will, if not already infected, quickly become so. Finding pyogenic bacteria in smears from suspected lesions is a valuable aid in diagnosis. I have been able repeatedly to demonstrate that the contents of minute pinhead size papulopustules in the axillary regions, which clinically would have been considered unimportant, on microscopic examination contained many staphylococci. It is my belief that impetigo "smoulders" in this form in a hospital nursery, only to break out later in an epidemic of blebs and bullae. Negative smears may be expected in a considerable percentage of all impetigo lesions, according to those who have made extensive bacteriologic studies.

It is a mistake to return isolated infants to the clean nursery as soon as the lesions have healed, for it may be assumed that the skin is still laden with bacteria. The infants should be kept separate until taken home. Isolation cannot be expected in my opinion to be 100 per cent effective in the control of impetigo as long as present day hospital nursery conditions exist.

Cross infection in the nursery probably most often occurs through the medium of the nurse's hands. Unfortunately, as Rulison[8] has pointed out, strict surgical technic cannot be applied to the nursery attendant. She cannot be expected to change gown and gloves every time she passes from one infant to the next, neither can the delicate skin of her hands withstand too frequent scrubbings and antiseptic applications.

Since the bathing equipment is often implicated as one of the principal modes of transfer of impetigo, many nurseries have abandoned routine daily baths. Instead, after preliminary removal of the vernix caseosa, the newborn is either given a daily oiling or its skin is left entirely alone except for the application of dusting powder.

The application of antiseptics to the skin for the purpose of preventing impetigo neonatorum has been widely practiced. Several Boston hospitals[9] report excellent results from the use of ammoniated mercury ointment in strengths of 2 to 5 per cent. Other institutions have not found this method so satisfactory. Kehoe[3] recommends 1 per cent copper oleate ointment, while Kellert[10] advises the use of a 50 per cent glycerine solution. More recently, Rood Taylor[9] has reported satisfactory prophylaxis by the daily application of a dusting powder containing mild mercurous chloride three parts, talcum two parts, and zinc oxide one part.

Realizing the limitations of strict aseptic technic in the prevention of nursery impetigo, Rulison[8] changed radically the plan of care of the newborns at Sutter hospital in Sacramento, Calif. The large nursery was abandoned and several small unit nurseries substituted. Each student nurse was assigned to the care of a unit of six babies and their mothers. The infants were kept in bassinets placed on individual movable tables, which also contained a place for bathing and dressing and storage room for clothing and diapers. Rulison found that this technic, by reducing materially the number of indirect contacts between infants, put an end to a siege of impetigo which had existed in epidemic or endemic form for three years. He also concluded that the system of assigning the care of both mother and child to one nurse was pleasing alike to parent and physician.

In connection with this it may be mentioned that the idea of small unit nurseries is quite in line with modern hospital construction. In order to prevent cross infections in children's wards, the newest hospitals limit the number in a single room to four to six children, and these are often further separated by cubicles. Contrast this with the condition found in the average nursery for newborns in a general hospital, where twenty to forty infants occupy the same room and are bathed on a common table. Obviously this crowded state furnishes an ideal means for the dissemination of impetigo and other nursery infections.

The actual treatment of impetigo is beset with difficulties, as testified to by the many and diverse methods recommended in medical literature. In its mild form the disease comes to an end in the course of a few days, with or without treatment. The principal factors favoring extension of the lesions are heat and moisture. Overheating the nursery and overdressing the infants should be avoided. It has been my practice to advise that, when the infant's condition permits, its clothing be partially or entirely removed several times a day in order that a drying effect upon the skin may be obtained. Carr[9] goes a step farther and recommends that in severe cases the infant be placed naked in a covered crib, in which is suspended an electric light.

The individual blebs should be opened as early as possible with a sterile needle and the contained pus removed by swabs dipped in alcohol. The list of antiseptics which have been advised for clearing up the infection is a large one. It includes alcohol in solutions of 70 to 95 per cent, 2 to 5 per cent ammoniated mercury ointment, 1 per cent copper oleate ointment, and an alcoholic solution of crystal violet and brilliant green (Berwick's dye). Mercurochrome solutions have also been employed. Other writers have advised touching the lesions with silver nitrate solution, the lunar caustic or the copper sulphate stick. Mild mercurous chloride dusting powder, which was mentioned under the subject of prophylaxis, has also been found of value in treatment.

Ultraviolet light radiation has in recent years become a popular adjunct in the treatment of impetigo. I have found that the daily application of a suberythema dose of ultraviolet light apparently has a very definite effect in hastening the disappearance of the lesions. Although the beneficial result might be attributed solely to a drying effect upon the skin, it would appear logical to conclude that there is in addition a definite bacteriocidal action upon the causative organisms, since these are situated superficially. In summer natural sunlight has proved a satisfactory substitute for the ultraviolet lamp.

In conclusion I should like the emphasize the following facts.

1. Mild impetigo neonatorum may change to virulent impetigo during an epidemic.

2. Continued outbreaks of the disease in hospital nurseries are the source of much trouble and embarrassment to the institutions and to the attending physicians.

3. The prevention of impetigo neonatorum should be systematically attempted by hospital staffs through committees appointed to govern the nursery.

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# ASTHMA OF NASAL ORIGIN*

CARROLL SMITH, M.D.
SPOKANE, WASH.

The cure of asthma by removal of nasal polypi was reported sixty years ago. Then in the early modern surgical era nasal surgery fell into bad repute on account of too much being done, the end-results of too drastic nasal surgery never being satisfactory. Next came along the work of the allergist, and his accomplishments were hailed as a panacea of respiratory ills.

As is the case in all real progress in our profession, we learn from experience, and the final word in diagnosis and treatment is made up of the best gleaned from all of the various methods and specialties. An analysis of the findings of the rhinologist, radiologist, bacteriologist, internist and bronchoscopist is many times necessary before we arrive at the best method of procedure in cases of bronchial asthma.

A good classification of bronchial asthma is as follows: (1) Those hypersensitive to some particular substance, usually a protein. (2) Those of infectious origin. (3) Those due to infection and who are also sensitive to some protein. (4) Those of reflex origin. This classification is practically the same as that of Stout of Philadelphia. The first group not coming under asthma of nasal origin will not be dealt with in this discussion. Perhaps 60 to 75 per cent of all cases of bronchial asthma come under the class of those due to infections of the nasal sinuses and to nasal reflexes. The dropping of mucopus into the pharynx and the subsequent infection of the mucous membrane of the larynx and bronchi are precipitating causes of the edema and spasm of the bronchial muscle, or a combination of this and the bacterial protein absorbed by the blood and lymphatic system accentuate these attacks.

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Nasal obstruction caused by deviations, hypertrophies and polypi, causing the breathing of cold air through the mouth on sensitive mucous membrane, aids in bringing on these attacks. It has been estimated that the normal nasal mucous membrane and that of the nasal accessory sinuses of a normal nose secrete a pint and a half of mucus every twenty-four hours. This aids in the warming and moistening of the air when properly inhaled through the nose. In cases of nasal obstruction this is not done and the subsequent irritation from the cold dryer air results.

Gottleib, Mullin and many others have shown that a majority of cases of asthma and bronchiectasis are associated with and are caused by diseases of the nasal sinuses. These sinusal diseases are not always profusely suppurative. In some of these cases transillumination and roentgenogram of the sinuses may be negative but there is a redness in the nasopharynx, particularly just back of the posterior pillar on each side. Irrigation of these antra may show only a few shreds of mucopus and here it is frequently not productive of good results.

The lining membrane, being somewhat thickened and perhaps cystic from a long standing mild infection, may be cured only by radical operation. It is in these cases, too, that allergic tests should be made. The sensitization to the protein may not in itself be sufficient to produce asthma, but an acute exacerbation of this old chronic infection, as in the case of a "cold," is frequently sufficient to provoke an attack. These are the kind of cases we frequently see that occur in the fall or during the rough changeable months, and are the patients who say they get along well in a warm mild climate during the winter.

The reflex type was well illustrated by the late Dr. Sluder. He demonstrated spasmodic contractions of the bronchi by irritation of the nasal or sphenopalatine ganglion which lies behind and above the posterior end of the middle turbinate. Many good results from asthma have been reported from corrections of septal deflections or the removal of septal spurs or of hypertrophic posterior tips of the middle turbinates in the region of the nasal ganglion. Asthma of reflex origin has also been proven by the removal of impacted cerumen, it having been caused by irritation of the vagus through its auricular branch.

I wish to briefly report three illustrative cases:

Case 1. A girl, age 9, first came under my care in 1917. Chief complaint, chronic cough and much expectoration of pus and slight asthmatic attacks past five years. Had been treated for tuberculosis. Had had left acute suppurative otitis media, smallpox and whooping cough. Tonsils and adenoids removed.

Examination showed very large middle turbinates, few polypi in middle fossae and antra suppurating. Roentgenogram showed typical bronchiectasis, no tuberculosis.

I treated this case over a period of five years, having to do radical antral operations, middle tubinectomies and several polyp and ethmoid operations. The asthma was relieved and the nose and general condition much improved, but some cough continued, for the bronchiectasis to a lesser degree persisted.

Comment: If the bronchiectasis is of such a character that it is felt to be a factor through absorption, in the production of asthmatic symptoms, then one should make an effort to remove this form of infection as well. In addition to the treatment of bronchiectasis by the correction of any sources of infection in the accessory nasal sinuses, as well as by general measures usually instituted in the treatment of bronchiectasis, I believe it is good surgery to perform a phrenicotomy, as advocated by Drs. Bisaillon and Matson of Portland. This procedure, by reducing the movement of the lung and diaphragm of that side, markedly reduces the cough, expectoration and also toxic absorption.

After phrenicotomy, if there is a good rise in the diaphragm, a reduction in lung volume of one-fourth to one-third is obtained, which closes off many bronchiectasic areas. Any procedure which relieves distressing cough and abundant expectoration and lessens toxic absorption no doubt prevents many reinfections and exacerbations, to which bronchiectatic patients are prone, and thereby improves the asthmatics general condition.

Case 2. June, 1924. Man, aged 60. Asthmatic attacks and nasal discharge for several years. Polypi in each middle fossa and antra dark. Of the ethmoids only the anterior ones were involved. On both sides a large polyp extended into the nose from the antrum, having caused a sloughing of the posterior portion of the nasoantral wall above the inferior turbinate.

Right and left radical antral operations produced complete relief from his asthmatic attacks.

Comment: This case is illustrative of the group reported by Dr. Stauffer in his paper in 1925, in which he claimed and demonstrated that most cases of suppurative ethmoiditis were the result of suppurative antra rather than the cause of that condition.

Case 3. January 22, 1929. Girl, age 16. Complaint and history: Asthmatic attacks and nasal obstruction since six years of age, first attack following a severe "cold." Has slept propped up on pillows for years. Tonsils and adenoids removed when seven years old.

Examination showed nostrils filled with polypi, antra dark on transillumination. Roentgenogram showed rudimentary frontals, cloudy antra and ethmoids.

January 26. Right and left radical antral operation. Antra were filled with polypi. Removal of polypi from middle fossa, also of part of left middle turbinate.

For three months she was free from asthma and was able to sleep flat in bed. She also gained twenty pounds in weight during that time, when attacks, but of less severity, again occurred. Polypi were found in each nostril, antra clear.

April 26. Right middle turbinate, right polypi and ethmoids were removed and on May 1 same operation on left side. No asthma since then, although a few small polypi have been removed on two subsequent occasions.

Comment: Here is illustrated the value of a rhinologic examination in asthmatics, this case being treated for many years by a very reputable general practitioner. This one also belongs to the group that has to be watched carefully for many years before she is free from nasal surgery.

### SUMMARY

1. A majority of cases of bronchial asthma are of nasal origin.

2. In certain cases a correlation of the findings of the several specialties is necessary to determine the cause.

3. All cases of nasal reflex asthma can be cured by appropriate surgery.

4. Best surgical results in cases due to nasal sinusitis are obtained in young people on account of the absence of peribronchial thickening and the chronicity of the infection so frequently encountered in the aged.

5. Cases due to antral infection are much more easily, permanentaly and quickly cured than those in which the ethmoidal and sphenoidal sinuses are involved. The diseased tissues of the antrum can be easily and permanently relieved by radical operation. Sphenoethmoidal surgery is less productive of good results on account of the necessity of conservatism because of the closeness to vital structures and on account of the tendency to recurrence of hyperplastic tissues.

6. Asthma due to infections in other parts of the body are exceedingly rare. I have seen no reports of asthmatic cures from the removal of gallbladder, prostatic infections or from extensive removal of infected teeth, and the much maligned tonsil is rarely if ever blamed for this disease.

7. The nose should be put in as normal condition as possible in early life by the proper correction of septal deflections and spurs. This will prevent many early infections which always have a tendency to produce sinusal disease, hyperplasias and polypi which, when once started, rarely if ever subside without more radical surgery than was first necessary, and which are the cause of many diseases of the entire respiratory tract.

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# MODIFICATION OF THE SIPPY CARDIOSPASM DILATOR

John H. Fitzgibbon, M.D., F.A.C.P.
PORTLAND, ORE.

The history of satisfactory nonsurgical dilatation of esophageal stenosis due to cardiospasm dates from the work of Russel,[1] who appears to have been among the first to realize that the condition was more common than generally supposed and "that if this condition were more carefully looked for it would be more frequently found." His paper, published in 1898, reports seven cases seen during eleven years preceding the date of publication. Four cases were cured by dilatation, one was much improved, one was not improved, and the other had not been treated.

His first case, seen in 1887, was treated by passage of bougies without improvement. He states, "I was then persuaded that further stretching beyond what a bougie could accomplish, or even overstretching as is practised on the anal sphincter, would be necessary to overcome the contraction. I accordingly made an instrument consisting of a sausage-shaped silk bag, rendered air tight by a very thin rubber bag within, and mounted on a tube or hollow bougie. This was passed through the stricture in a collapsed state and blown up by an air syringe when in position. This method proved successful; after a time swallowing became normal and continues so, the lady being now alive and in good health."

Sippy,[2] in 1903, devised a rubber bag dilator which was at first mounted upon a whalebone staff and distended with air under measured pressure. A conical metal bulb, with a lateral canal for passage of a previously swallowed silk thread guide, was screwed to the tip of the whalebone staff. A silk or linen bag surrounded the rubber bag and a rubber condom was drawn over the cloth bag. He later modified this instrument by constructing the dilating bag upon a flexible metal spiral, previously intended for passing dilating olives in treatment of organic stricture of the esophagus. In this form the dilator is passed over a piano wire which has been guided into place in the esophagus by a silk thread. The increased flexibility and simple construction of this instrument, with introduction simplified by use of the piano wire, make it a very satisfactory means of dilating strictures due to cardiospasm, and it has been used in a great number of cases.

The earliest water distended esophageal dilator I have been able to find in the literature was described by Pyle,[3] in 1900, and used for dilating a stricture resulting from typhoid ulceration of the esophagus. It consisted of a rubber bag surrounded by silk and rubber coverings attached to a tube rendered somewhat rigid by a wire passed through it. Distention was produced by pumping water into the bag with a pump connected to a vessel containing water. Pyle states, "The method of treatment has been so entirely successful that I believe that it will be universally adopted for not only similar cases but all cases of stricture of the esophagus, rectum, sigmoid and of the descending colon." An illustration showing the details of construction and method of use of the instrument accompanies his paper.

Plummer,[4] in 1906, described a hydrostatic dilator which he had devised and used in a number of cases with good results. This type of instrument has in the intervening years been used with continued success.

Other dilators and modifications have been developed, of which Smithies'[5] air bag and Zohlen's[6] expanding olive are the most recent.

As all previously described instruments have been more or less satisfactory in the treatment of cardiospasm, one hesitates to offer a modification of any in common use. There are certain cases, however, in which there is a greatly dilated and angulated esophagus above the hiatus. This renders it extremely difficult to insert a dilating bag and successfully dilate the stricture. The piano wire, passed along a silk thread, usually makes insertion of the Sippy bag relatively easy. Wires of various sizes and degrees of flexibility may be used to suit the individual case.

Even though the wire and bag are properly inserted, satisfactory stretching is at times difficult in a markedly dilated and angulated esophagus. In one such case, seen in May 1927, upon watching the Sippy dilator under the fluoroscope, it was seen that the unsatisfactory result was due to the fact that the bag tended to slip upward into the esophagus while being inflated. The esophagus being markedly enlarged (fig. 1, a), there was ample room for the flexible shaft of the instrument to bend laterally and permit the bag to slip out of the stricture. This could not be controlled by manipulation from above. The tendency to slip upward was obviously due to inflation of the bag from the upper end. As air entered the bag from above, the upper part was distended and pulled the instrument upward and into a position unsuitable for efficient dilatation.

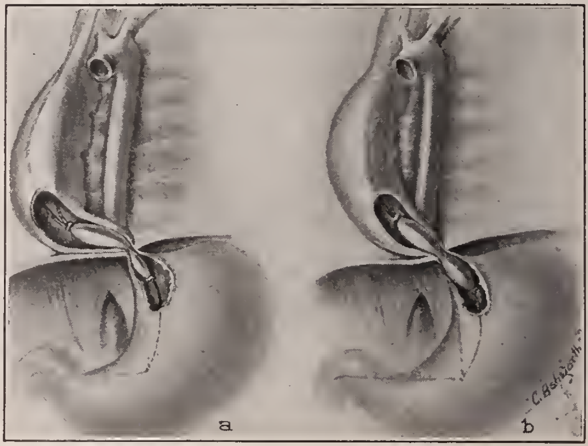

Fig. 1 (a). Dilated and angulated esophagus with old type of bag slipping upward. Note lateral bending of shaft of the instrument.

(b). The modified bag, inflating from both ends, does not slip.

To overcome this difficulty, bags of various size and shape were tried, but all tended to slip upward while being inflated. The idea of inflating the bag from both ends simultaneously was then developed and found to be a satisfactory solution to the problem. Simultaneous inflation of the upper and lower ends of the bag is accomplished by extending the tube through which air enters so that it reaches the lower half of the bag. Openings are left at both the upper and lower ends for admission of air (fig. 2). Fluoroscopic observations of the modified bag show that it remains in place and satisfactory dilatation is obtained.

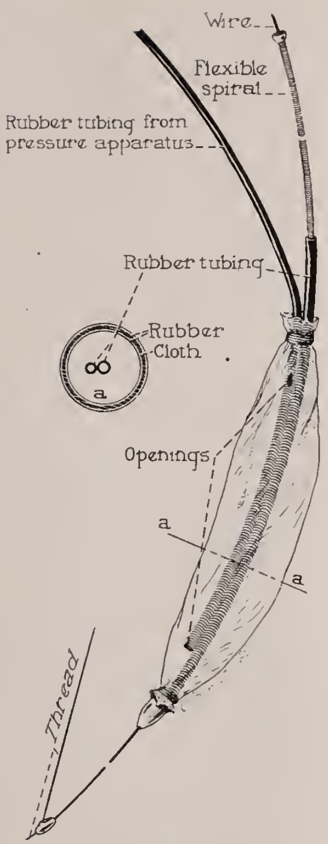

Fig. 2. Modified Sippy cardiospasm dilator showing method of inflating from both ends.

I have used the modified instrument since May 1927 and feel that it is a distinct improvement over the old type of dilator. The bag may be mounted upon a whalebone or other type of shaft when the piano wire guide is not used. It is a very simple matter to construct a dilator, using rubber condoms and silk or linen cloth for the bag. The inflating tube is attached to a sphygmomanometer and hand pump, and accurate control of pressure is secured. Bags of various size may be made ranging from four to seven inches in circumference. They may be made somewhat smaller at the middle than at the ends to aid in preventing slipping.

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1106 Stevens Bldg.

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# AMEBIASIS IN THE NORTHWEST

## ITS SYMPTOMOLOGY IN CARRIERS*

G. H. Hummel, M.D.
SALEM, ORE.

The prevalence of infection with the endameba histolytica in temperate climes, such as the United States, was not fully appreciated until after the world war. When I came to Salem a little more than a year ago, and questioned members of the medical profession as to the frequency of amebiasis in Oregon, I was told that it is very rare and is hardly ever encountered. Such is not the case. My experience has been that it is comparatively frequent. The work of Kofoid, Boeck, Rivas and lately of Craig and Kessel has demonstrated that from 10 to 15 per cent of the population of the United States are infected with the endameba histolytica. As we would expect, a larger percentage of infection is encountered along the Southern border and in California on account of its large Mexican, Philippino and Oriental population.

In 1926 Craig called attention to the frequency of symptoms due to amebiasis in apparently healthy persons. Careful questioning will elicit the fact that more than 50 per cent of so called carriers (that is contact-carriers who never suffered from dysentery) do complain of symptoms which will invariably disappear on specific medication. If the carriers of this parasite did not suffer physically from this infection, it would be of little importance except from the standpoint of prophylaxis. It is unfortunate that the term "amebic dysentery" is still used in our medical textbooks. Amebiasis would be a much better term, because the ameba may cause a multiplicity of symptoms aside from dysentery, and attack other organs such as the skin or the bronchi. We should get the idea out of our minds that amebiasis means dysentery. The patient may have no symptoms at all, when infected with this protozoon. And yet this same person may at any time, when his resistance is lowered, develop definite clinical symptoms, as a rule limited to the digestive tract and the nervous system, or he may develop a chronic colitis.

At this point I wish to emphasize that when a diagnosis of colitis is made, we often deal with protozoon infections. At the Portland session of the A. M. A. meeting Smithies pointed out that in cities adjacent to rural communities, intestinal protozoiasis is of frequent occurrence. In Chicago he found protozoic infestations in 300 instances amongst 3600 patients. This incidence is probably larger yet in the West, because of the prevalence of Japanese truck gardeners and their fertilizing garden truck with dejecta and contaminated well water, and because of the increasing immigration of Mexicans and Philippinos all over the West and the North, many of whom are carriers of the ameba.

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To mention an example, nine months ago the health officer of one of the Northern California counties found 40 per cent of the Japanese vegetable growers and over 20 per cent of the whites infected with the ameba histolytica. Furthermore, there is an increase in raw food eating, due to propaganda emanating from cultists and advertising in health columns. These raw food faddists are potential manure eaters, because garden truck is contaminated during growth by dejecta and contaminated water. In countries like China, Central America and Mexico you frequently meet foreigners who never eat raw vegetables or drink water. The ever present danger of contracting typhoid or amebiasis is for those people a good excuse to quench their thirst only with beer or wine.

The clinical aspect of amebiasis has gradually acquired a protean character. While dysenteric symptoms, such as frequent evacuations, mixed with mucus and blood, colicky pains and tenesmus are characteristic of the acute form of the disease, the great majority of these infections are not accompanied by dysenteric symptoms at all, but by much milder symptoms usually attributed to some other cause, and are not recognized as a result of infection with this parasite. The most careful questioning is, therefore, necessary regarding any mild symptoms the patient may have and which he thinks of not sufficient importance to report to the physician. The acute form of amebiasis, as described usually in textbooks, has to a large extent veiled and hidden the significance of the less marked and milder symptoms of the chronic type. The physician, not acquainted therefore with this form, is liable to overlook it entirely or diagnose it for some other condition, because the average medical man in this country does not realize the widespread extent of amebiasis, and because he forgets that dysenteric symptoms are the exceptions and not the rule, as Craig pointed out several years ago.

What are the symptoms of the patient affected with chronic amebiasis? They are largely limited to the digestive tract and the nervous system, and can be gotten from the patient by questioning him closely. Many of these people are considered neurasthenics. Some of them are quite frequently discovered accidentally during a routine examination of the stool for ova and occult blood in suspected gastric or duodenal ulcer or colitis. The most typical complaint is constipation alternating with diarrhea. The patient as a rule states that he is constipated for several weeks and that this period of constipation is relieved by a mild attack of diarrhea lasting a day or two.

He describes his stools as ill formed, semiliquid and mixed with mucus. If those loose stools are examined microscopically, large numbers of actively motile amebae and also cystic and precystic forms are found. He thinks that his mild diarrhea is due to some indiscretion in his diet, and since it is of short duration, he seeks no medical advice. His constipation returns, to alternate again after a few weeks with diarrhea. These diarrheal attacks occur usually at night, and are preceded or accompanied by a feeling of malaise, headache, vague abdominal pains evanescent in character, and distention of the abdomen.

Another frequent complaint of the carrier is lack of appetite and soreness of the abdomen, especially of the right and left iliac fossae, due to the fact that the ameba preferably attacks the cecum, the descending colon and sigmoid. Physical examination reveals tenderness without rigidity over the cecum or the ascending colon, leading often to a diagnosis of appendicitis or cholecystitis.

Another train of symptoms is referred to the nervous system, all as Craig has pointed out, of the neurasthenic type. These patients complain of vague headaches, attacks of neuralgia in the arms and legs and arthritis. They lack pep and are unable to do their daily work. They suffer from insomnia and morning tiredness. Their memory is poor and they show marked nervous irritability. On exertion they notice palpitation which subsides after rest.

A quite typical symptom in the carrier is the excessive perspiration of the hands and feet, which feel moist and clammy. All these features indicate absorption of toxic material from the intestine. Subnormal temperature is the rule, though I had one case which ran a temperature for a full year. The blood picture is fairly constant. A moderate secondary anemia is present, ranging from 3,500,000 to 4,000,000, with a hemoglobin of 75 to 85 per cent. The white count shows a moderate leucocytosis, ranging from 11,500 to 14,000 with a relative lymphocytosis.

I might mention at this point that amebiasis of the cecum may frequently simulate acute appendicitis. The first case I saw in Salem was of this type. Cole, Engman and White reported during the past year cases of amebiasis cutis, i.e., extensive ulceration of the abdominal skin following appendectomy with drainage.

Now a word about the life cycle and the pathologic conditions this parasite produces. The ameba is ingested in the form of the cyst with raw vegetables, contaminated by dejecta or impure water. Food handlers working with vegetables coming from contaminated soil become infected, after which dissemination is very easy by careless workers and by flies, as O'Connor and Wenyon have shown. In the Chicago epidemic (February, 1929) the infection was disseminated by night cooks, vegetable salad girls, five pantry girls and kitchen help in general.

The transformation of the actively motile ameba to the resistant cystic form occurs, when the living conditions become unfavorable for further continuance of vegetative multiplication. The amebic cyst (similar to the ova of intestinal worms) sheds its capsule and develops into the live ameba in the colon, where it exerts its action as a true tissue parasite, living on the tissue of its host, man, ingesting red blood cells and causing multiple ulcers in the colon. These ulcers vary in size from a large pin head to a dollar. They are round or oval, have a raised border, undermining the healthy mucosa. The floor of the ulcer is covered with mucus and necrotic tissue and is dark red in color.

Whether the endameba histolytica secretes an endotoxin in addition to the cytolysin which cause the ulceration of the intestinal mucosa is still undecided. Craig thinks that the toxins of streptococci, staphylococci and B. coli are absorbed through these multiple ulcers caused by the amebae. He reasons thus: If there are many thousands of these ulcers, the patient develops fulminant dysentery, and if there are just a few, he only complains of the vague digestive and indefinite nervous symptoms of chronic amebiasis.

In regard to diagnosis of this disease, the routine examination of the feces cannot be too strongly emphasized in people complaining of the above mentioned symptoms. I usually test the stool first with benzidin for occult blood. Another point of importance is that the amebic stool is alkaline in reaction, while the stool in bacillary dysentery or the normal stool is acid. If blood is present, I anoscope or sigmoidoscope the patient for possible ulcers in the rectum or sigmoid. If flakes of mucus are found, some of it is immediately placed on a warmed slide, a cover slip is applied and the specimen examined first with low power to locate the amebae and then with oil immersion.

The parasites, which often have a raspberry-like appearance from the ingestion of red cells, are readily found and can be recognized by their motility and their thrusting out pseudopodia. If no amebae are found on anoscopy, the patient is instructed to bring a specimen of stool which is examined by the iodine and eosin stain for cysts. This stain will bring out the four nuclei perfectly. The cyst itself will stain a yellowish green. Fortunately I am able to show a case of mixed infection, quadrinucleate cysts of the ameba histolytica and octonucleate cysts of the nonpathogenic ameba coli. If repeated (i.e., six consecutive) stool examinations are negative, I give a provocative intravenous injection of one-half grain emetine, after which the patient quite often passes a stool mixed with blood streaked mucus, in which amebae may readily be detected.

The treatment of these cases is dietetic and medicinal. A soft diet mechanically and chemically nonirritating is indicated. A milk diet in severer cases is preferable, because it produces an acid reaction in the stool. Emetine, yatren, anayodine and emetine-bismuthiodide, and occasional stovarsol or neoarsphenamine are used to combat this infection. One must always keep in mind, however, that there is a marked tendency to relapse.

During the past eleven months seventeen cases of chronic amebiasis were seen in office practice. Five of these patients were returned missionaries from China, Japan and Korea. The remaining twelve have lived in Oregon and Washington from one to twenty-nine years. Four were one time residents of California and Arizona. The remaining eight have lived in the Northwest permanently. What role the Filipino and Japanese populations play in disseminating any infection would be interesting to find out.

I wish to report some of the more interesting cases, which will bring out the symptoms in the carrier quite clearly.

Case 1. R. C., a girl, 15 years old, has lived since her sixth year in Spokane, Wash., and for the last thirteen months in Salem. In 1928 she had five attacks of pain in the right lower abdomen which were diagnosed appendicitis. In February, 1929, I was called when she had another attack, characterized by some nausea, sharp pain over McBurney's point, but a subnormal temperature.

The red count was 3,367,000, the white count 11,900, the hemoglobin 80 per cent. She was constipated, nervous, irritable and tired easily in school and at play. She had occasionally a few loose stools.

She had amebic dysentery at the age of six in Ceylon, India, where she was born. An ice bag did not relieve her abdominal pain. The stool was strongly positive for occult blood. No cysts or live amebae were found. There were no ulcers on proctoscopy.

A provocative intravenous injection of emetine was given, and the next day her mother notified me that the patient had two semiliquid passages, covered with blood streaked mucus, which showed numerous amebae on microscopic examination. Two courses of emetine and yatren were given, and her attacks which simulated appendicitis ceased. She gained weight, her anemia was relieved and she is well.

Case 2. A. S., a man, came to the office with a complaint of tired feeling, loss of weight, cramps and soreness in epigastrium, constipation and spells of diarrhea. He had those symptoms for the last seven years. A diagnosis of duodenal ulcer was made four years ago in California, because his epigastric pain and nausea were relieved by alkalies and a Sippi diet.

When he brought his stool to be examined for occult blood, I found that it was streaked with mucoid blood. Microscopic examination of this mucus showed a few motile amebae and many cysts. The patient was referred to the Portland Veterans Hospital, where the diagnosis of amebiasis was confirmed. Incidentally the barium meal showed a duodenal ulcer besides. I did not suspect amebiasis in this case, and the parasite was only accidentally found.

Case 3. Mrs. J. T., a woman 59 years old, permanent resident of Salem for the past twenty-nine years. Complained of pain in her right hip and knee, alternate periods of constipation and diarrhea.

The patient was seen in consultation with Dr. Thompson on account of her hip. The radiograph showed tuberculosis of the acetabulum and head of the femur. One year ago she was at a Portland clinic, where a diagnosis of cholecystitis was made because of colicky attacks of pain and tenderness over her gallbladder, and cholecystectomy was advised. The same diagnosis was made by another clinician. I also thought she had gallbladder disease.

Because of her marked anemia I asked her to bring a specimen of her stool, to rule out possible gastric conditions, such as ulcer or malignancy, and advised a Graham function test. The feces were alkaline in reaction, showed a strongly positive benzidin test and were covered with a few flakes of thick mucus which on examination showed numerous amebae. The pain in her hip and knee and her upper abdominal complaint overshadowed the other milder symptoms, such as alternate constipation and diarrhea, evanescent lower abdominal pains to such an extent that I did not think of amebiasis. Again the parasite was found only accidentally. After emetine and anayodine administration her abdominal symptoms disappeared and she had no more colicky pains in her gallbladder region.

Case 4. O. W., a boy, two and a half years old, lived in Salem for the past twelve months. Father is a native of Chile, mother an American. The child was perfectly well until a month ago, when he became irritable, fretful, did not want to play any more, lost four pounds of weight and his appetite. The family history is important. The aunt of the boy died six months ago of perforation of the bowel due to amebiasis, in a Portland hospital. The boy lived with this aunt for four weeks.

Physical examination was negative, except for tenderness over the descending colon and sigmoid and a marked anemia. The hemoglobin was 80 per cent, the red count 4,102,000, the white count 12,800. The tonsils and the ears were negative. The afternoon temperature was 98.2°. The stool was passed in the office and showed a mixed infection of ameba histolytica and ameba coli which is nonpathogenic. The listless child changed within a few days after emetine and yatren administration. Amebiasis in children is quite rare, while bacillary dysentery is more frequent.

Case 5 is interesting. Miss V. F., aged 19. Complaint, daily fever, ranging between 99° and 99.6° for the past twelve months, lack of ambition and inability to work and study; constipation, clammy perspiration of hands and feet; soreness in lower abdomen on right side; occasionally loose stools. These symptoms started a year ago, when she was taking the nurse's course in a Los Angeles hospital. Though she never had any cough, a diagnosis of incipient pulmonary tuberculosis was made. Roentgenograms of her lungs, which were taken at that time and later were negative for tuberculosis.

She was advised to stop training and rest. She stayed at home for eight months, but her symptoms did not clear up. Her tiredness and lack of ambition increased and she did not even care to engage in any social affairs with friends of her age.

I saw her first on Nov. 26, 1929. She was a well nourished young woman. Her cheeks were flushed. Her temperature at 3 p.m. was 99.4°. Physical examination was negative except for tenderness without rigidity over ascending and descending colon, and a palpable spleen. The lungs were clear. Blood count: Hemoglobin 85 per cent, red cells 4,095,000; white count, 4,100; small lymphocytes 31 per cent. Patient's serum agglutinated bacillus typhosus in dilutions from 1:20 to 1:1280. Agglutination was negative for paratyphoid bacilli, brucella abortus and bacillus melitensis.

A diagnosis of typhoid fever was made rather too hastily because of her leucopenia and positive Widal, only to be discarded the next day, when the patient reported she had one prophylactic injection of typhoid vaccine a year ago. She then was proctoscoped, but no ulcers were found, although the benzidin test was strongly positive. Three consecutive stool examinations were negative for amebae and cysts.

A provocative intravenous injection of emetine brought about a copious loose stool, streaked with blood and mucus, in which numerous amebae were found. In spite of putting the patient to bed for four weeks and pushing specific treatment to the limit, her temperature did not go down and ran between 98.2° and 99.4° for three months. Dr. Manlove thought there was a possibility of intestinal tuberculosis, but her gain in weight, the gradual disappearance of her symptoms and repeated negative examinations for tubercle bacilli brought us to the conclusion that she had some large amebic ulcers higher up in the colon, with secondary infection causing this continuous fever. Bismuth mixtures in large doses and continued anayodine administration finally brought the temperature down.

Case 6 demonstrates how easily one can miss the diagnosis. The infection was recognized only a week ago. Miss H. H., 25 years old, complained of tiredness and exhaustion, perspiration of hands and feet, insomnia and distaste for food for the past three months. She has lived all her life in Salem.

Physical examination showed she had infected tonsils, incompletely removed eight years before, and atrophy of the right eyeball, due to an injury received ten years previously. There was some tenderness over the cecum and the sigmoid. Under general anesthesia the eye and the tonsils were enucleated by Dr. Findley and me about nine weeks ago. In spite of persistent treatment by Drs. Findley and Baum, the socket refused to heal, secreting a seropurulent exudate.

A month after the operation the patient complained of clammy perspiration of the hands and fever. I thought she was run down and had the grippe. The red count at that time was 3,305,000 and the white count 11,200. She was put on iron and arsenic and improved. A week later she came in again, complaining of continuous fever and pain in her hip joint. The white count had risen to 16,300 with a lymphocytosis of 24 per cent. A roentgenogram of her hip joint was taken by Dr. Thompson to rule out tuberculosis. The film was negative. Agglutination for typhoid, paratyphoid, brucella abortus and B. melitensis was negative.

Finally I examined the stool and it was strongly positive for occult blood. A few cysts were also found. Proctoscopy showed two small ulcers above the first valve of Houston, covered with mucoid blood, in which numerous motile amebae were present. Up to date the patient has received eight emetine injections and the arthritis in her hip joint has disappeared. The chronic inflammation of the orbit has given place to a normal looking mucosa.

This case was as much a surprise to me as it was to Drs. Findley and Baum. In this patient there was a complete absence of intestinal symptoms. She had a typical amebic arthritis and the chronic inflammation of the orbit was due to the amebiasis.

### SUMMARY AND CONCLUSIONS

Chronic amebiasis is characterized by mild symptoms, exhibited mainly in the digestive tract and the nervous system.

Our conception of rare occurrence of amebiasis in the Northwest should be modified.

A routine examination of the feces for cysts and amebae is indicated in all cases, presenting vague intestinal and nervous symptoms.

The symptoms of these carriers can be cured by specific treatment.

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# EXTRAPLEURAL THORACOPLASTY *

PHILIPP SCHONWALD, M.D.
SEATTLE, WASH.

In this discussion of ninety thoracoplasties performed on forty-five patients, I endeavor to illustrate the favorable change in the prognosis of far advanced pulmonary tuberculosis, brought about by the surgical treatment of this disease; also to present the modifications and the advance in viewpoints and methods based upon personal experience and observation. Modifications and advance are brought about through the tendency not to be orthodox in this work, but to stay open to suggestions and improvements, gathered either from personal contact with workers in the same field or from the literature.

All these thoracoplasties were performed in collaboration with Dr. Winkel of this city, who bears the brunt of the purely surgical responsibility and to whom I am very much indebted for his excellent surgical aid. I shall briefly discuss our various experiences concerning the indications and contraindications for thoracoplasty, the technic, pre- and postoperative management, and then review our results.

### INDICATIONS

Thoracoplasty is indicated if (1) the patient cannot reasonably be expected to recover without surgical intervention; (2) the disease is far advanced and unilateral; (3) extensive adhesions render the induction of a satisfactory artificial pneumothorax impossible.

The second point strikes one of the most important questions in the consideration of thoracoplasty in a given case, namely, the condition of the contralateral lung. The general agreement is that the other lung must show no involvement at all or only a small inactive process. The experience in our series of cases seems to evaluate the great importance of a careful study of the contralateral lung.

In seven of our cases the other lung showed some involvement, in the majority of these even some activity being present. Four of them or 57 per cent are dead; two or 28 per cent are arrested; one or 14 per cent is still ill. Of ten cases with slight and inactive involvement of the contralateral lung, three or 30 per cent are dead; four or 40 per cent arrested, and three or 30 per cent are still ill. The remaining twenty-two cases did not pre-

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sent clinical or radiologic evidence of disease in the other side. Two or 9 per cent of them are dead; sixteen or 72 per cent are arrested; and four or 18 per cent are still ill.

It seems to follow that one of the first and most important considerations for the indication of thoracoplasty must be the condition of the contralateral lung, and that activity in the other side constitutes a priori a contraindication. This must not necessarily mean that such a patient could never be subjected to collapse therapy. In many of my cases I have been able through concentrated effort within a few months to improve the other lung sufficiently, so that we could proceed with thoracoplasty.

As to the third point, I want to put particular stress upon the word "satisfactory." It has been the experience of all specialists that an incomplete pneumothorax very seldom leads to cure, because it does not effect good collapse and immobilization of the lung. It is only a loss of valuable time to keep up an incomplete pneumothorax which has not brought about the disappearance of symptoms within a few weeks.

Thoracoplasty is contraindicated, if the general condition of the patient is very poor, the hemoglobine below 60 per cent or a severe tuberculous complication somewhere else in the body exists. Moderate laryngitis is no contraindication. We have encountered it in one case. This patient suffered a slight flare-up of her laryngitis about four months after operation, apparently due to too much activity and talking, but showed good improvement under proper treatment.

Tuberculous enteritis, which is not looked upon as a strict contraindication by some authors, has in our experience proven to be the most unwelcome and fateful complication. Of our fatalities, five were due mainly to enteritis. In but one of our cases, where a tuberculosis of the intestines developed after operation, has this condition cleared up satisfactorily. In three of the eleven cases, complicated by enteritis, this condition was present before thoracoplasty was performed. In the eight others it developed sooner or later after the surgical procedure, or better to say it then became evident.

The pneumonic type of tuberculous infiltration is usually listed among the contraindications. Two such cases were in our series. One was unsuccessful, probably due to a complicating syphilis; one had a remarkably good result.

Reviewing our various experiences concerning operative technic, I will first discuss the methods of anesthesia used in our series. The first eighteen operations were done under general anesthesia, nitrous oxide and oxygen being employed. Three cases, who succumbed to pneumonia, were subjected to this method of anesthesia. We then changed to colonic ether anesthesia, using a mixture of ether, paraldehyde and olive oil. This proved to be a quite successful procedure and not much postoperative trouble was encountered following the seventeen operations in which it was used.

Our last fifty-five operations were done under local anesthesia. We used ½ and 1 per cent novocaine, the infiltration being done in layers. Skin and subcutaneous tissue are first anesthetized and after their dissection the muscles and intercostal nerves are infiltrated as we go along. We note that Willy Mayer advocates this very same method of fractional local anesthesia, as we have been practising for three years. Local anesthesia has proven to be the ideal procedure. Coincident with its introduction we have experienced the disappearance of most postoperative complications. Patients generally are comfortable in a very few days. There is no vomiting or nausea as a rule. During the operation there is no suppression of reflexes and, therefore, no danger of aspiration or congestion. If done rightly, it affords absolute anesthesia and the best recommendation for its efficiency in this respect is the fact that in not even a single instance has a patient after the first operation, done under local anesthesia, suggested that we use a general anesthetic for the next stage. We always give 1/6 gr. morphine and 1/150 gr. scopolamine one hour before and another 1/6 gr. morphine fifteen minutes before operation.

A technical point which has been the object of some controversy is the question whether it is better to begin at the top and resect the upper ribs first or vice versa. We have in most of our cases followed Sauerbruch's argumentation and started with the resection of the lower ribs. In six cases only have we followed Lilienthal's and Alexander's suggestion, to begin with resection of the ribs of the apex. Among these are our two cases of immediate postoperative mortality and another casualty. It seems to me that the danger of aspiration and congestion is greater with this procedure, as Sauerbruch has pointed out many years ago, because most of the lungs which require thoracoplasty show the important pathology, especially cavities in the upper lobe, while the lower lobes contain more breathing lung tissue.

By compressing the upper lobe first the secretion from the cavities is forced into the larger bronchi and is apt to be aspirated into parts of the lower lung, causing tuberculous pneumonia, a danger which is naturally augmented by the law of gravity and the temporary suppression or diminution of the cough reflex, due to the use of narcotics immediately after operation. In three of these cases, where the upper ribs were resected first, only one stage operation, namely collapse of the upper half of the thorax, was contemplated. Two had a good collapse of the lower lobe by pneumothorax. Nevertheless the resection of the lower ribs appeared necessary in these instances after some months; in one case, because aspiration and caseous infiltration of the lower lobe had resulted, in the other, because a large cavity in the upper lobe could not be brought to compression with resection of the upper ribs alone.

This leads us to another consideration of operative technic, namely, the question whether a partial thoracoplasty is feasible as an effective method to collapse only part of one lung, which method may be desirable if one lobe of the lung in question seems to be in such good condition that a collapse of this lobe would not be warranted. We have met this situation on five occasions, twice in one patient.

This man had a fibrocavernous phthisis of the right upper lobe and what seemed to be an inactive process in the left apex. Thoracoplasty of the right upper lobe was performed with apparently good result. Several months later the roentgen examination disclosed a large cavity in the other, the left apex.

In the meantime symptoms of tuberculous enteritis had also appeared and the performance of a thoracoplasty of the left apex was postponed until almost two years later. We then proceeded to resect the four upper ribs of the left side with the intent thereby to abolish the apical cavity. To our great disappointment, however, the cavity was not obliterated but slid downwards and forwards, and only the anteroposterior diameter was diminished. Seven months later we proceeded to collapse the cavity by extrapleural apicolysis. Pieces of the first and second ribs from the sternum to the clavicle were resected, then the apical adhesions bluntly broken until a complete collapse of the cavity was evident. Part of the incision was left open and the space previously occupied by the apex of the lung was filled with rubber-dam.

The patient made a good recovery immediately after the operation, but suffered what seemed to be a cold ten days later. Bilateral pneumonia developed. He showed some improvement after the onset had been overcome but had a sudden relapse and died two weeks after the operation.

A necropsy gave us a chance to check up on what we had accomplished with these plastic operations on both upper lobes. There was a complete healing of the multiple cavitations in the right upper lobe. The recently compressed cavity in the left upper lobe was also perfectly collapsed. Nowhere in both lungs was evidence of active tuberculosis. Both lower lobes were hepatized. There were some ulcerations in the ileum.

Another patient had a number of large cavities in the left apex which were held open by broad adhesions, while the lower lobe was well collapsed by pneumothorax. We resected the four upper ribs and found again that the cavities had diminished in size, but were not collapsed. A complete thoracoplasty was performed recently, which we expect to abolish the cavitation.

I have mentioned above a similar case and so there remains one case out of four who has done well so far, after resection of the upper ribs alone (May 3, 1929). We have come to the conclusion that collapse of part of a lung with partial thoracoplasty is not a method of choice and should be attempted only under exceptional indications.

This rule, however, does not apply to extrapleural apicolysis which is indicated in cases where cavitation of the apex exists without any appreciable amount of disease in the rest of the lung. Apicolysis is not a plastic of the thorax, because there is no intent to change its shape or to reduce its volume and only enough rib is removed to gain access to the dome of the lung. The preferable route of approach is from the front, by resecting the sternal portion of the first and second ribs. When the dome of the apical pleura is loosened, dissected from its normal and pathologic adhesions and pushed downwards, an extrapleural cavity is formed which must be filled. If not very large, a transplant of fat is advisable according to Tuffier's method. If a large cavity results, then filling it with rubber-dam, in order to produce gradual granulation, is the method advocated by Lilienthal, which we also have followed in our case.

Thoracoplasty, as the name implies, is a plastic operation, a remodeling of the thorax, and must not necessarily be a procedure confined to two stages. While in the majority of cases the classical two-stage operation creates enough collapse to facilitate good retraction and cure of the lung, it happens at times that one or two more interferences are necessary in order to reach the desired collapse. This is true especially of the so-called barrel-chests, where the ribs are standing out horizontally from the spine. It is rarely necessary in the typical phthisic chest with its slanting ribs and narrow interspaces. In two of our cases such an additional stage was necessary and effective (figs. 1 and 2).

An interesting way of performing thoracoplasty was described by Duval, Quenu and Welti, namely, the approach by the axillary route. The incision is made in the midaxillary line. With specially constructed curved instruments the ribs may be de-

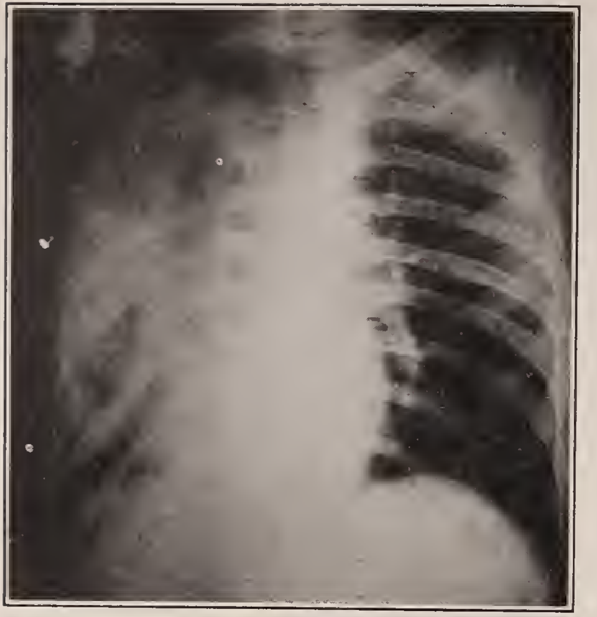

Fig. 1. Collapse of a barrel-shaped chest, performed in three stages. Note the convexity of the chest contour.

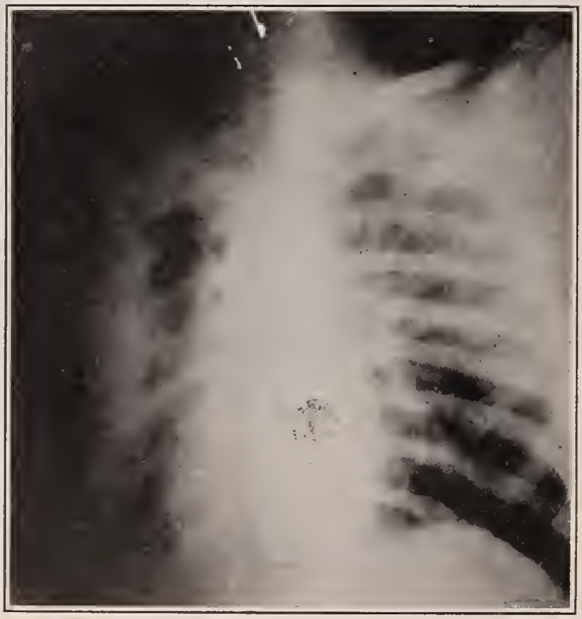

Fig. 2. The same case as in fig. 1 after an additional stage by the axillary approach had been performed. Note the improved collapse. This patient is now in excellent condition.

nuded posteriorly to the spine and anteriorly, if desired, to their sternal connection. The authors claim that even the first rib may be reached by this route quite easily, admitting, however, that the brachial plexus must be drawn aside during the actual cutting of the first rib. I am afraid that such a procedure would cause a severe neuritis, which may last several months, as Coffey has experienced, when he resected the first rib by the anterior approach. We have used this axillary route in one case, where an additional stage was necessary in order to effect a better collapse of the upper lobe. We found this method very simple and useful for this purpose.

Another interesting modification was recommended by Descarpentries in Roubaix, France, who performs his thoracoplasties by keeping the patient in a sitting position, arms and head resting forwards on a table. He performs an operation which is more like the posterior stage of the old Wilms pillar resection, only removing small sections of ribs at the angle. We have tried this position, which seemed to have the one advantage that the patient must not lie on his better side for an hour or so during the operation, which often causes discomfort for obvious reasons. But we found the sitting position was tiring our patient more than the usual way.

A point which has been the object of much discussion is the question of the necessity or advisability of performing a phrenicoexairesis before each thoracoplasty. Such has been recommended by several authors, by some as a test to show whether the other side is good enough to stand up under the strain of more work. Then, again, phrenic avulsion is said to be a necessary adjuvant in bringing about a more complete collapse of the operated lung by the rising diaphragm. I have had occasion in previous papers on this subject to emphasize my standpoint as somewhat contrary to both of these considerations.

As a test of the other lung, phrenicoexairesis alone is not radical enough a change in the respiratory equilibrium to really bring out the limit of what the contralateral lung will stand. In the great majority of the cases which come to thoracoplasty the lung to be operated on is so much destroyed, fibrosed and contracted and does so little actual breathing, due to its greatly reduced vital capacity, that the other lung has had plenty of opportunity to show its resistance during the preceding course of the disease. As a synergistic operation to complete the collapse, it is in most cases superfluous.

We deal usually with cases where the diaphragm is flattened, immobilized and the costodiaphragmatic sinus obliterated by previous pleurisy. Otherwise these same cases would be fit for artificial pneumothorax, and would not need thoracoplasty. Jacobaeus voices the same opinion about phrenicotomy, as well as Low, who goes so far as to pronounce that phrenicoexairesis is never indicated in cases of thoracoplasty.

We have performed phrenic avulsion in only six cases in connection with thoracoplasty. In one case it was used as a test of the other lung. After four months, while the contralateral lung seemed to stand up well, thoracoplasty was performed and the patient succumbed nine days later to pneumonia of the other, the tested lung. In two cases, four years after successful thoracoplasty, an active process developed on the base of the collapsed lung; the phrenic nerve was avulsed, in one instance apparently a very successful procedure. Of our twenty-two arrested cases there are only two who required a phrenic avulsion four years later. All the others got well without it (figs. 3 and 4).

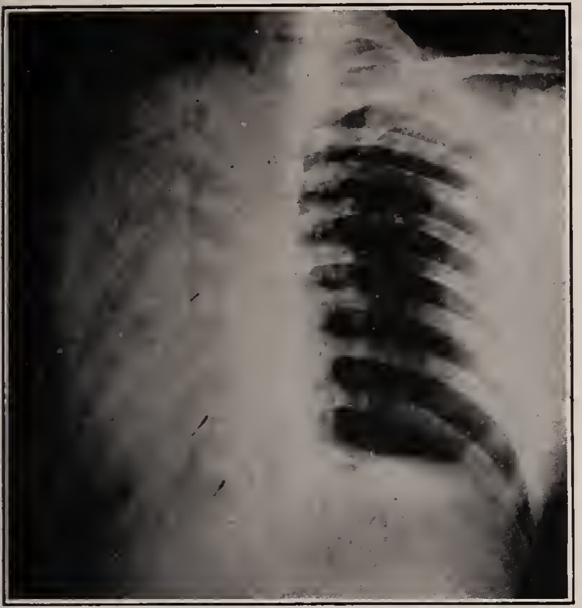

Fig. 3. Collapse of the left lung with the typical Sauerbruch operation. Although the volume of the hemithorax has been decreased only slightly, the result was perfect. The patient has been well for three years.

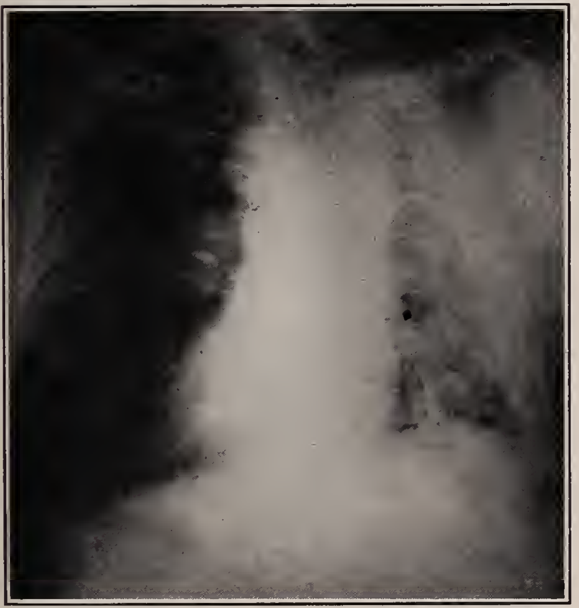

Fig. 4. Collapsed by the combined operations of Brauer and Sauerbruch. Note the complete abolition of the upper lobe. This patient has been well for three years.

The technic which we followed was at first the paravertebral extrapleural thoracoplasty according to Sauerbruch, which later we changed to a combination of this and Brauer's method of subscapular rib-resection. Inasmuch as in the vast majority of cases the important cavitation and fibrosis is situated in the upper lobes, a more complete collapse of these is desirable, which can better be accomplished by Brauer's method of resecting large segments of the second to the fifth or sixth ribs. The lower lobe, usually less affected, does not need to be collapsed so severely and is afforded a chance of recovery by Sauerbruch's method of resection of shorter segments of the lower fifth or sixth ribs.

All of the patients operated on, with the exception of one case of multiple lung abscess, suffered from pulmonary tuberculosis of the third stage, i.e., infiltration with cavity formation of more than one lobe, the majority of them unilateral, with no or little involvement of the other lung. Some, however, had more pronounced infiltration of the contralateral lung, while in one case, as mentioned above, after thoracoplasty on the right side, a large cavity made its appearance in the left apex which necessitated a surgical collapse of this apex also.

### PREOPERATIVE AND POSTOPERATIVE MANAGEMENT

Our preoperative management has been very simple, consisting of some digitalization in cases where a fast pulse or a marked accentuation of the second pulmonic seemed to warrant some cardiac support. Normal saline and glucose is given intravenously sometimes during the operation or immediately afterwards. In more resistant cases we give it by proctoclysis. Caffeine-sodium-benzoate and camphor are valuable as stimulants, when needed. Sufficient morphine or pantopon is given to alleviate the postoperative shock, pain and cough.

As soon as the skin wound is healed, the operated side is strapped, but not too tightly, with elastic adhesive which later is replaced by an Oelgoetz splint. The patient is kept at a complete rest in bed for at least two months and then gradually moved out of bed, provided that his symptoms have completely subsided. One year after the second stage the patient may, as a rule, be allowed to return to a more or less normal life, with the logical restrictions which the possession of only one workable lung reasonably seems to demand.

### RESULTS

To value the statistics of our results and those of other workers in the same field, you will bear in mind that heretofore the prognosis of pulmonary phthisis of the third stage, in which satisfactory collapse by artificial pneumothorax was impossible, was absolute infaust quoad sanationem as to possible cure, and very dubious quoad vitam as to the chance of prolonging the life.

There were altogether forty-five cases, thirty-one female and fourteen male patients. In five cases one operation was performed, in thirty-seven two stages, in two three stages, and in one four stages. Of these forty-five patients nine are dead. Five of these were bad risks to begin with, only operated upon as a last resort, three of whom suffered from a complicating tuberculous enteritis and succumbed to this, as we have learned, the most dangerous complication in thoracoplasty cases. They lived, however, from two to eighteen months after the operation.

One patient had an acute phthisis and syphilis, and died from pneumonia eight days after operation. One had primarily a good result, but after dissipating and abusing himself, succumbed two years after operation to enteritis. One patient died eleven days after the second stage from influenzal pneumonia and pericarditis, one ten days after apicolysis from bilateral lobar pneumonia, and one nine days after the first stage from pneumonia of the other lung. Two cases constitute our strictly postoperative mortality or 4.4 per cent. The other seven are the late mortality or 15.5 per cent.

Of the thirty-six surviving, eight are to be considered still ill. Two of these suffer from tuberculous enteritis; four or five of these eight patients offer a good prognosis. Twenty-two, or 56 per cent of the thirty-nine cases operated on a sufficient length of time ago, are to be considered as permanently arrested. They are either working or in working condition. Six cases have been operated on too recently to be classified.

In speaking of bad risks, I may anticipate your question as to why we operate on outspoken bad risks. The best explanation I can offer is the fact that, among the surviving thirty-six, are eleven whom we considered just as bad risks as the deceased, and six of these eleven are arrested cases. It follows that by refusing the nineteen bad risks who offered themselves, we would have forfeited their only chance, which eleven of the nineteen won, six with apparently definite good results.

The favorable outcome in 56 per cent of the thirty-nine cases, who were operated on a sufficient length of time ago, seems to be a very gratifying achievement in view of the seriousness of the disease. Other ailments of similar gravity, as cardiorenal disease or cancer, do not show nearly as good statistics. Our figures compare well with those of Archibald, who reports 62 per cent positive results, namely cures and improvements, also with Sauerbruch's 68 per cent, Gravesen's 66 per cent and Alexander's 58 per cent.

During the last few years thoracoplasty has gained the recognition it deserves as a very important treatment of far advanced pulmonary tuberculosis. The results improve with the growing experience of the surgeon and this naturally leads to a widening of indications, thereby bringing more of the hitherto hopeless cases within the scope of this operation. Someone has figured that, even with a very conservative selection, there are at least 30,000 cases in the United States suitable for thoracoplasty. The important workers in this field agree that thoracoplasty is not a subject for the general surgeon, and that specialization and close cooperation with the phthisiologist are the fundamental requirements for success.

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Functional Dysinsulinism with Epileptiform Seizures. Three cases of "epilepsy" due to dysinsulinism or hyposuprerenalism have been treated by Johannes M. Nielsen and Elmer L. Eggleston, Battle Creek, Mich. (*Journal A.M.A.*, March 22, 1930), with frequent feedings or with suprarenal gland or with both, and the attacks of unconsciousness have ceased. In one case there had occurred twelve, in another more than 100 complete seizures with many petit mal attacks; yet all attacks ceased under this treatment. The period of observation in the third case is not yet long enough to justify absolute conclusions. The starvation blood sugar (taken before breakfast one morning) is not always or in all cases an index of the prevailing low point in the patient studied, especially in cases of functional dysinsulinism. In cases of functional dysinsulinism the blood sugar may rise or fall markedly without any premonitory sign that we can at present detect. The degree of increase in blood pressure under the influence of epinephrine is not necessarily any indication that the blood sugar has risen, or vice versa. Frequent feeding alone may suffice in these cases to prevent epileptiform seizures, but frequent feeding plus suprarenal gland by mouth is a surer way of maintaining sufficient blood sugar to prevent attacks.

# CONSULTATION IN GENERAL PRACTICE *

E. J. Jasper, M.D.
ASTORIA, ORE.

Medicine is a science noted for its voluminous literary efforts. One may choose from his library an endless discussion on asthma, pneumonia, the symptoms of appendicitis or the technic of almost any operation imaginable. But let one search for the subject of consultation, it immediately becomes apparent that little has ever been said on such an important and vital subject. The writer has never read a discussion on the subject, hence the references shall be meager indeed. Many an apology may also be given in advance, as this expresses the view of one who has been in general practice only eleven years.

Consultation is a term of great elasticity. It is a variable factor, differing in each locality according to the number of physicians and specialists in the community, tempered also by the atmosphere which has been created by such a local fraternity. Consider also the difference between consultation in a closed group clinic as compared with the keen competition of an open general practice. In all these details the writer will not attempt to define or discuss the finer points of distinction. Only one prime effort outstands all others in this respect, that consultation must be a cooperative affair, tending to benefit both parties, the consultant and the one calling consultation. Without this basic principle consultation can not exist for economic reasons. From this point a definition is ventured. Consultation is the cooperative effort and deliberation between two or more physicians with respect to the diagnosis and treatment of a serious illness.

In general practice the number of consultations is held to a minimum insofar as it is possible to do so. The cases which require deliberation are few but nevertheless urgent. Just what number should be held varies on the ability and judgment of the physician. Also on his prestige and standing in the community as a general diagnostician and practitioner. In general it may be said that the following cases require consultation:

1. Cases in which blindness is apt to result.
2. A bullet wound in the abdomen.
3. Injuries or accidents which will result in permanent disability or deformity. Deforming fractures, the loss of a limb, permanent invalidism or the loss of a sense organ.
4. An injury accompanied by unconsciousness extending over twelve hours, in which no surgery has been contemplated.
5. Pathologic childbirth. Septic complications, placenta previa or a dystocia requiring surgical intervention of a serious degree.
6. Medicolegal cases.
7. A fulminating case of meningitis, diphtheria or tuberculosis, in which death is apt to occur on the first day or less.
8. An acute abdomen which on exploration discloses unusual findings of a fatal prognosis.
9. An acute or lingering illness, in which the family is not satisfied.
10. Cases beyond one's ability, requiring special skill, apparatus or treatment.

To this list no doubt each physician could contribute others, varying with his experience or environment. It will not be necessary to detail the above named cases further. Most conditions are self-evident and of such a frequency that the logic of them can readily be understood.

The time element is occasionally to be considered before calling a consultant. The proper time in fever and medical cases is before the family becomes weary or dissatisfied. It is never advisable to wait until the family wants consultation. It is more expedient to do the proposing yourself and thus also perhaps have the choice of a consultant. Again, it might be said it is not advisable to call consultation too early. Especially is this true in fevers with a crisis like pneumonia. Also to wait until the undertaker is around the corner is not the proper time for consultation. In emergency cases of great necessity, consultation should be called immediately.

If one should be so unfortunate as to have the family call in another physician and had neglected the time element, this would be unfortunate indeed. The doctor in charge may occasionally remain and face the embarrassment of the situation. Should the consultant be agreeable, so much the better for the profession. It is at least evident that one's confidence has been partially if not entirely lost. More frequently it would be better to come to a quick decision and drop the case entirely. Neglect to properly time consultation has lost patients to many physicians.

The time element having been considered, the question arises, whom should one call in consultation? In general, one should try to call on his superiors. The superior may be an elder in the profession, one skilled in special work or a youth in the role of a specialist. When superiors are not available, one next highest in order should be chosen. Conversely, one should not allow or agree to call in a consultant who is an enemy. Such an enemy might be a physician with whom no one is

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* Read before a meeting of Clatsop County Medical Society, Astoria, Ore., Jan. 8, 1930.

able to agree and who cares not a whit for the opinions of any of his confreres. Such a physician should automatically be debarred from consultation of any sort. The same should also apply to a consultant belonging to some other cult or profession which is not recognized. If the patient insists on such consultation, tell him that it is impossible to do so, state the reasons, and drop the case immediately.

The manner in which deliberations usually take place at the bedside varies considerably with what is customary in the community. Also the distance from a medical center has an influence. It would be a happy circumstance, if rules might be drafted to cover all cases. Perhaps the best answer would be, "when in Rome, do as the Romans do." However, without much apology the following general rules are proposed:

1. Consultation should be private. Friends or relatives should not be in the room. Some consultants like to display honor upon themselves with bombasity or an overdone technic.
2. Consultant should be given time and not unexpectedly called into a case which might require deep study and deliberation.
3. Medicines should not be changed abruptly by reason of calling in a consultant.
4. If a surgeon is called, and an operation deemed advisable, the physician in charge should propose the operation. He may state a little later, as the result of consultation an operation is deemed advisable.
5. After consultation is held the information should remain confidential. If members of the family or friends question the consultant, he should answer by stating that "I have given Dr. Blank all the information. He is in charge and will explain matters to you."

A mistake too often made by the consultant is that he is willing to take charge of the case afterwards. This is rather a grave mistake, made usually by young and inexperienced consultants. I once asked a certain physician his opinion in the matter and he replied: " A good rule would be that once a consultant, always a consultant." This no doubt expresses the attitude of some physicians on the subject. A consultant is not to take care of the patient unless the physician in charge expressly wants him to do so. If the family wants the consultant, they should secure a release rather than ask for consultation. This point should be clearly understood by the family before consultation is attempted. A consultant who steals your cases is unethical.

The conditions under which consultation is held are often so that the physician in charge and the consultant can not be at the bedside at the same time; or if in hospital practice, the consultant may be asked to see a certain patient in the absence of the physician. Under such circumstances and even in the presence of the attending physician, the following outline is proposed. In the matter of a personal estimation, this appears to be the ideal method of consultation under all conditions.

1. The consultant should examine the patient.
2. He should write a brief sketch of his findings.
3. Write the diagnosis, or probable diagnosis, if this can be done.
4. Suggestions as to the treatment. References to further study.
5. Prognosis of the patient.

In a hospital this can be written on the record sheet. In private practice the written slip should be given to the physician in charge. It is for his information and study. A carbon copy may be retained by the consultant, if he so desires. This method would eliminate bombasity, unusual display, sustained silence, aftertalk and all the evils which so often follow the ordinary loose methods of consultation. A written record is more business like and more scientific. It requires more knowledge and greater effort. At the present time in standardized hospitals many written records are required from the attending staff. The same principle should apply to holding consultations. The latter is of greater importance, due to the urgency and extreme responsibility of the situation. As a recipient of several methods of conference, I am heartily in favor of written consultations.

The position of a consultant is not an easy one to fill. Very often too much is expected of him. He has to be unusually cautious not to offend anyone or any procedure thus far taken with the patient. When he finds the physician entirely wrong, it takes the best of maneuvering and strategy of words to save the honor of the day. The consultant should be preeminent in the art of diagnosis. He should not be an ordinary, but at most times an extraordinary diagnostician of rare ability and good judgment. Conversely, a consultant, whose percentage of correct diagnoses is small or of little help, soon loses his prestige and position as confrere to that particular physician.

In conclusion, a successful consultant is one who benefits the patient and establishes a closer degree of friendship with respect to himself and the physician in charge. This requires tact, reserve, good judgment, correct diagnosis and a carefully announced expression of affairs at the opportune time and psychologic moment. It is indeed a gift of which few of us are capable of rendering.

NORTHWEST MEDICINE
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# EDITORIAL

## LEPROSY IN THE UNITED STATES

A recent bulletin of U. S. Public Health Service has discussed leprosy in the United States. No evidence has been found of its existence prior to the arrival of Columbus. It appears to have manifested itself coincidentally with the early settlements and progressed with them. Cartagena, in the Republic of Colombia, was the center of the slave markets and became the focus of leprosy on the continent, the first leprosarium of the new world having been established in that city. Likewise New Orleans, an important center in the slave traffic, became an early focus of leprosy and in 1778 a special hospital was constructed for the exclusive care of these patients. As settlers proceeded up the Mississippi Valley leprosy followed them.

Probably not all of the leprosy in the Valley was chargeable to the slave traffic, some cases coming among the early voyagers. Certain French settlers from New Brunswick, Canada, conveyed the disease to Louisiana. It is reported that the focus in New Brunswick was attributed to sailors from a French vessel which was wrecked on the coast in 1758. Infected clothing was distributed among fisherman from leprous Orientals among the crew. Another focus of infection was established in the Great Lakes region by immigrants from Norway and Sweden. While cases in this section numbered 168 in 1897, they have greatly dwindled to an insignificant number at the present time.

Although leprosy is one of the oldest diseases of which authentic knowledge is available, it has always been one of the least understood and most maligned. It has been only in the last few decades that the terror aroused by the word leprosy has been to some extent allayed. The belief that "once a leper, is always a leper" has quenched all hope in the afflicted and brought consternation to family and friends. Improved therapeutic measures of recent years have proven that the fate of a leper is not necessarily hopeless and increasing numbers are annually discharged from leprosariums as cured or no longer a menace to public health. The discovery of the leprosy bacillus about fifty years ago, by the Norwegian scientist, Hansen, has enabled investigators to differentiate leprosy from other diseases with which it was formerly confused. While the disease differs in no respect from true leprosy of past centuries, its differentiation from unrelated diseases has led the way to its rational treatment and elimination of the old-age terror excited by its presence.

## WASHINGTON GRADUATE MEDICAL COURSE

The Extension Service graduate medical course of the University of Washington will be held in Seattle July 14-18. The meetings will be scheduled in Aeronautics Hall, the new Guggenheim building, which has just been completed. The faculty will consist of Dr. E. S. Judd, of the Mayo Clinic, on surgery; Professor Tom Addis, Stanford University Medical School, on medicine; Dr. Karl Meyer, of the Hooper Foundation, Berkeley, Calif. and Dr. Joseph Brennemann, of Chicago, on pediatrics.

Drs. Judd and Addis are well known to the profession of the Northwest and need no introduction to assure a warm reception from all who are able to attend these lectures. Dr. Meyer is an expert in bacteriology, pathology and serology. He will bring to his audience the latest information on these subjects. He is especially versed in the practical application of serology, particularly in its application to infantile diseases. He will offer the latest research work in the diagnosis and treatment of poliomyelitis and encephalitis. He has recently returned from Europe, where he has familiarized himself with all research work pertaining to public hygiene.

Dr. Brennemann, formerly professor of pediatrics at Northwestern University and president of the American Petdiatric Society, is now the head of the Children's Memorial Hospital at Chicago. He is one of the most outstanding men of the day in this line of practice. He will offer much of interest not alone to pediatricians but to those engaged in general practice. The committee in charge of this course believes that an exceptionally attractive program awaits the class which it is expected will assemble in large numbers at the July meeting.

## HONOR TO DR. WILLIAM HENRY WELCH

Celebration of the eightieth birthday of Dr. William Henry Welch, many years associated with Johns Hopkins University, is an event of interest to practitioners of medicine in all parts of the world. This ceremony is scheduled to occur in the Hall of the National Academy of Sciences, Washington, D. C. April 8. A portrait etching by the well known American etcher, Alfred Hutty, has been made for this occasion. The program will be broadcasted so that Dr. Welch's hosts of friends and admirers may participate in the enjoyment of the congratulatory addresses and response.

Probably no living physician has made greater discoveries or perfected more noteworthy advances in medical science than Dr. Welch. From the first years in medical school to the concluding days of medical practice one pays tribute to the substantial benefits derived from knowledge originated by his genius. Few men are privileged to be numbered among the immortals of medical history. With them this great man will be included. His name is inseparably attached to certain features in bacteriology, pathology and medical practice which will ensure him undying fame among coming generations of practitioners of medicine. We join the medical profession of our nation in the hope that he may be spared for many years of useful activities.

## DR. WILLIAM HOUSE

The death of Dr. William House of Portland has removed one of the outstanding figures among medical practitioners of the Northwest. By virtue of his keen intellect and proficiency in his specialty of neurology and psychiatry, he was a leader in that line of practice. He was a gentleman of studious habits, a thinker who did not accept all things till proven. He was a tireless worker, of pleasing personality, always ready to lend encouragement to younger men. He was interested in everything pertaining to the advances in medicine, and during the long period of residence in Portland took an active part in many phases of medical study and progress.

For more than twenty years he has been associated with Northwest Medicine. When the tristate medical organizatio nwas instituted in 1909, he was one of the group of Portland physicians who conferred with representatives from Washington and Idaho for the promotion of that project. When it was determined to select a medical journal to represent the three state associations, he was active in establishing Northwest Medicine to function in this official capacity. He has been continuously available in supplying editorials and scientific contributions for the pages of the journal. His interest and advice have been utilized on many occasions to the profit and advantage of this publication. His loss will be felt not only in professional circles but also by the management of this journal.

## FELLOWSHIPS AT CLEVELAND CLINIC

The Cleveland Clinic Foundation offers four two-year Fellowships in Medicine, beginning on July 18. Applicants must have had at least one year of hospital intern service. These fellowships carrry payments of $1200 for the first and $1600 for the second year. The holder has an opportunity for extensive and varied practical service. Weekly lectures and pathologic conferences at which clinical problems are discussed will be additional attractions. Application blanks can be secured from the Secretary of the Fellowship Committee, Cleveland Clinic, Cleveland, Ohio.

# MEDICAL NOTES

### OREGON

Oregon Tuberculosis Association held its fifteenth annual convention in Portland Feb. 25-26. An attendance of two hundred was recorded. The meeting was opened with an address by Dr. William Johnston, president of the Oregon State Medical Society. Dr. G. C. Bellinger, superintendent of the state tuberculosis sanatoriums at Salem and at The Dalles, and Dr. E. O. Sisco, medical director of the Chemawa Indian school at Salem, reviewed the progress made by Oregon in the control of tuberculosis. Addresses were also made by Dr. Estella Ford Warner, who has been representing the Commonwealth Fund in experimental public health work in Marion County, and by Dr. F. D. Stricker, secretary of the state board of health. A series of round table discussions by members of local public health units was held. Officers of the association who were reelected for the ensuing year are: President, L. G. Clark; vice-president, Leslie Butler; treasurer, A. L. Mills; secretary, Miss Cecil L. Schreyer.

Health Program Outlined. A program of development of public health activities in Jackson county has been outlined by Dr. B. C. Wilson, county health officer. Many of the features are in accord with recommendations made by Dr. W. F. Walker of the American Public Health Association who visited Medford last October. A comprehensive county health department is planned, under whose direction clinics will be established for diagnosis of disease, control of tuberculosis, the feeding of infants, etc. A campaign to learn the incidence of typhoid fever in this region will be launched and efforts will be made to popularize such prophylactic measures as smallpox vaccination and administration of toxin-antitoxin.

**Status of Obstetric Practice Defined.** The privilege of practicing obstetrics in Oregon is open to osteopaths, chiropractors and naturopaths as well as to regularly licensed physicians and surgeons, according to an opinion rendered last month by Attorney General Van Winkle. According to him there is nothing in the state law which specifically prohibits cultists from accepting maternity cases.

**Clinic Enlarged.** A new $100,000 wing to the Dr. R. C. Coffey Clinic and Hospital in Portland is now under construction. It will be three stories in height, of reinforced concrete and will provide accommodations for thirty-five patients.

**Guest Lecturer.** Dr. Franklin C. Mann, professor of pathology and surgery at the Mayo Clinic, Rochester, Minn., delivered the annual Joyce lecture on surgery before the Portland Academy of Medicine March 13. His subject was "Experimentally Produced Pathology of the Liver." A dinner in his honor at the University Club preceded the lecture.

**Appointed to Examiners Board.** Dr. C. C. Newcastle, of Portland, was recently appointed a member of the state board of medical examiners to succeed Dr. J. F. Wood whose term has expired.

**Central Willamette Medical Society** held a dinner meeting at the Osburn hotel in Eugene March 6. Three visiting physicians from Portland were guests of the society and conducted a symposium on the subject of colitis. Dr. F. R. Menne described "The Pathology of Colitis," while Dr. J. H. Fitzgibbon discussed "Diagnosis and Treatment."

**Dr. Karl Knitter** of Coquille has moved to Myrtle Point, where he formerly practiced.

**Dr. W. H. McKinney** of Weston has opened an office in Athena. He intends to divide his time between the two towns.

**Dr. Eugene Rockey** of Portland, accompanied by Mrs. Rockey and Mr. W. B. Ayer, sailed from New York April 15 on the Conte Biancamano for a trip to Europe.

**Dr. A. E. Kidd** of Portland is convalescing from a serious attack of influenza.

**Wedding.** Dr. Leon A. Goldsmith and Miss Bertha Goodman, both of Portland, were married at the home of the bride's parents, February 20.

## WASHINGTON

**Hospital to be Enlarged.** At a recent meeting of the national board of trustees of the Shriner's hospitals, held in St. Louis, it was decided to appropriate $10,000 toward the cost of erecting a new unit at the Spokane Shrine hospital for crippled children. This amount, added to a fund already accumulated, will make possible the immediate construction of a $65,000 wing to the hospital.

**Snohomish Hospital Planned.** A committee representing service clubs and benevolent associations in Snohomish is now investigating the possibilities of erecting a modern community hospital in that city. Two sites have been offered for the purpose. It is planned to finance the project by popular subscription.

**Professional Building Opened.** The new Medical Arts Building at the corner of Palouse and Mission Streets in Wenatchee was recently completed and is now in operation. The structure is two stories in height, of fireproof construction, and cost $90,000.

**St. Joseph's Hospital,** Tacoma, held a staff meeting March 3, at which an address on "Head Injuries" was given by Dr. W. W. Swift of Seattle.

**Tacoma Surgical Club** entertained two hundred visiting surgeons from Western Washington and Oregon, March 8. The opening session was devoted to the reading of scientific papers. In the evening a banquet was held at the Winthrop hotel. Dr. Ernest G. Martin, professor of physiology at Stanford University Medical School, San Francisco, Calif., delivered an address on a physiologic subject. Dr. E. A. Rich is president of the society.

**City Physician Appointed.** Dr. M. S. Wright, formerly of Mount Vernon, has been appointed physician and surgeon in the Spokane city health division. He succeeds Dr. William Lee who resigned to engage in private practice in Seattle.

**Spokane Academy of Ophthalmology and Otolaryngology** at a recent meeting elected officers for the ensuing year. Those chosen were: President, A. N. Codd; vice-president, Paul Remington; secretary, Marc Anthony.

**Dentists Addressed.** Drs. George Anderson and C. A. Veasley, Jr., addressed the members of the Washington State Dental Association at the annual convention held in Spokane March 13-15. Their subjects dealt with the relation of dental infections to systemic disease.

**Cowlitz County Medical Society** held a meeting March 11 at the Hotel Monticello in Longview. Dr. A. G. Bettman of Portland, Ore., reviewed his experiences with plastic surgery.

**Dr. H. E. Nichols,** formerly intern at the Seattle City hospital and more recently engaged in practice in Olympia, has returned to Seattle, where he has taken over the roentgenologic practice of the late Dr. R. C. Baumgarten.

**Dr. P. C. West** of Seattle returned to his home early last month, following a hurried trip to Paris to the bedside of his small daughter who was desperately ill with pneumonia. The child is now convalescing.

**Dr. E. S. Kimball,** retired physician of Spokane, sustained a fracture of the skull and other injuries late in February when he was struck by a motor truck in Spokane.

**Dr. A. J. Saxton,** until recently a member of the staff of the King County hospital, Seattle, has located for practice in Enumclaw.

**Dr. Cecil Fargher,** a graduate of the University of Oregon Medical School, has opened an office in Wenatchee.

**Dr. W. D. Turner,** of Seattle, has moved to Winlock, where he is associated in practice with Dr. W. W. Webb.

**Dr. H. J. Fitz,** county health officer of Grays Harbor county, returned to his duties last month, following an illness of several weeks duration.

**Dr. E. W. Brennen,** who formerly practiced in Michigan, has opened an office in Kirkland.

**Wedding.** Dr. Warren W. Bell and Miss Geraldine Reynolds, both of Seattle, were married in that city February 20.

## IDAHO

Dr. Homer D. Junkin, who has been engaged in practice at Idaho Falls for the past ten years, has moved to Paris, Ill., where he will engage in surgical practice, having taken over the practice and hospital operated for many years by Dr. Roland Hazen who recently died.

## OBITUARIES

Dr. William House, prominent neuropsychiatrist of Portland, Ore., died at his home, March 6, following a prolonged illness, aged 56 years. He was born in Ellenville, N. Y., in 1873, and graduated from the University of Buffalo School of Medicine, Buffalo, N. Y., in 1895. In 1904 he moved to Portland, where he soon built up a large practice in his chosen field. He was active in medical affairs, having served as president of the Portland City and County Medical Society and of the Portland Academy of Medicine. He was professor of medical jurisprudence and assosciate professor of nervous and mental diseases at the University of Oregon Medical School from 1908 to 1920. Dr. House has served for many years as an associate editor of Northwest Medicine.

Dr. James M. Powell, retired pioneer physician of Monmouth, Ore. died at the home of his sister in Monmouth, February 23, aged 77 years. He was born in Albany, Ore. in 1852, and graduated from the University of California Medical School, Berkeley, San Francisco, Calif. in 1876. He practiced for a short time in Lebanon, Ore. and then moved to Spokane, Wash., where he was instrumental in organizing the Spokane Medical Society. Later he returned to Monmouth. He retired from practice several years ago and engaged in orchard culture.

Dr. William Strother Gaines, Spokane, Wash., died at St. Luke's hospital in that city February 24, following a brief illness, aged 76 years. He was born in Tennessee in 1854 and graduated from Bellevue Hospital Medical College, New York, in 1887. He came West soon afterward and settled in Oaksdale, where he practiced for eighteen years. He then moved to Spokane and opened an office in the Hillyard district.

Dr. John Carl Hill, Boise, Idaho, died at St. Luke's hospital in that city, February 18, following a brief illness, aged 43 years. He was born at Hannibal, Mo. in 1881, and graduated from the University of Colorado School of Medicine, Denver, Colo., in 1907. He had practiced at Boise for the past nineteen years.

Dr. John Albert Mapes, Seattle, Wash., died at the United States Veterans' hospital March 14 following an operation, aged 57 years. He was born in Michigan in 1872, and graduated from the University of Michigan Medical School, Ann Arbor, in 1897. He had been attached to the Seattle division of the United States Veterans' Bureau for several years. During the war he served as a captain in the United States Army Medical Corps.

Dr. William Flanagan, Grants Pass, Ore., died in that city, February 17, aged 75 years. He was born in 1855, and graduated from Willamette University Medical department, Salem, Ore. in 1884. He was one of the pioneer physicians of Grants Pass where he served as coroner and city councilman.

Dr. Daniel Buckley, Seattle, Wash., a son of the pioneer Seattle physician, the late Dr. Daniel Buckley, died from pneumonia at the Seattle City hospital, where he was serving an internship, aged 23 years. He was born in Seattle in 1906, and graduated from Washington University School of Medicine, St. Louis, Mo. in 1929.

# REPORTS OF SOCIETY MEETINGS

## OREGON

### PORTLAND CITY AND COUNTY SOCIETY

Pres., K. A. Kiehle; Secty., H. P. Rush

Portland City and County Medical Society met in the auditorium of the Medical-Dental Building, Portland, Feb. 19. The meeting was devoted to a consideration of protecting the sight of school children's eyes.

Dr. W. F. Hoffman, Seattle opthalmologist, related his ten years experience with sight saving clinics in the Seattle schools. The subject was also discussed by Dr. F. A. Kiehle, president of the society, and Dr. Helen C. Cary, Portland school physician.

## WASHINGTON

### KING COUNTY MEDICAL SOCIETY

A general meeting of King County Medical Society was held in the auditorium of the Medical-Dental Building, Seattle, March 3, at 8:20 p.m, President D. H. Houston being in the chair.

Dr. Raymond Somers presented an interesting report of a fatal case of suppurative pericarditis together with the pathologic specimen. Dr. H. J. Davidson reported a similar case, in the treatment of which he fixed a small catheter in an opening of the pericardium, irrigating with a weak permanganate solution.

Dr. H. J. Davidson reported the inactivity of the committee appointed to investigate contract medicine and stressed the need of action.

Major H. C. Mallory of the United States Army delivered a short address on R. O. T. C., urging more doctors to join this organization.

Dr. Albert M. Snell of the Mayo Clinic presented a paper on "Diagnosis and Treatment of Jaundiced Patients." Cases of jaundice are classified as obstructive, intrahepatic and hemolytic. Diagnosis of hemolytic jaundice rarely presents great difficulties. About 60 per cent have stones in the biliary tract which complicates the picture. Intrahepatic jaundice presents a more difficult problem. Cases may include catarrhal jaundice, toxemia of pregnancy, biliary or portal cirrhosis, toxic conditions caused by drugs or industrial poisons. It is important to avoid operation in these cases. Obstructive jaundice is commonly due to calculus, carcinoma or cicatrix. Stone in the common duct seems to be the commonest cause. Carcinoma presents a picture often resembling that from stone. Preoperative diagnosis is rarely made. Diagnosis of common duct stricture is readily made from the history. Presence of complete or intermittent obstruction of the bile passages demands surgical treatment. No satisfactory method of combating hepatic toxemia or insufficiency has yet been devised.

Applications for membership from Drs. S. N. Berens and F. H. Wanamaker were read. Drs. W. W. Collins and T. T. Dawson were duly elected to membership.

On motion of H. J. Davidson, it was voted that the general meeting adjourn to March 10, in order that action on the subject of contract practice might not be delayed until the next general meeting thirty days hence.

### LEWIS COUNTY MEDICAL SOCIETY

Pres., H. L. Petit; Secty., Rush Banks

The regular monthly meeting of Lewis County Medical Society, preceded by a dinner, was held at Lewis-Clark Hotel, Centralia, February 10, President H. L. Petit in the chair.

Dr. Walter Kelton of Seattle presented a paper on "Spinal Anesthesia."

Dr. Herbert E. Coe of Seattle read a paper on the "Operative Treatment of Harelip and Cleft Palate."

Dr. H. E. Cleveland of Burlington, president of the State Association, addressed the society, extending an invitation to attend the annual meeting to be held at Bellingham in September.

The regular monthly meeting of the society was held March 10 at St. Helens Hotel, Chehalis, following a dinner, President Petit being in the chair.

Dr. C. W. Shannon of Seattle read a paper on "Blindness of Nasal Origin."

Dr. J. H. Harter of Seattle read a paper on "Frontal Sinus Suppuration and Its Cure."

### PIERCE COUNTY MEDICAL SOCIETY

Pres., C. F. Engels; Secty., W. B. Penney

The regular meeting of the Pierce County Medical Society was held at the Tacoma Hotel, Tacoma, March 4. A dinner in the Stone Room preceded the meeting.

Dr. Albert M. Snell, of Rochester, Minnesota, gave the only talk of the evening, which was a thorough and complete discussion of the diagnosis and treatment of jaundice. This talk covered the observation and work of the Mayo Clinic during the last several years, and was amply illustrated with lantern slides.

### SPOKANE COUNTY MEDICAL SOCIETY

Pres., C. B. Ward; Secty., R. P. De Riemer

A special meeting of Spokane County Medical Society was held March 7 in the Paulsen Medical and Dental Auditorium, Spokane.

Dr. F. C. Mann, internist from the Mayo Clinic, delivered an address on "Physiology of the Biliary Tract."

Dr. C. M. Doland discussed the Porter bills. On motion of Dr. Doland it was unanimously voted to file a protest with the Washington members of the House of Representatives against the passage of these bills.

The regular monthly meeting of the society was held March 13 in the Marie Antoinette Room of the Davenport Hotel in conjunction with the Washington State Dental Association.

PROGRAM

"Medical Manifestations of Dental Pathology." (a) General, Dr. George Anderson. (b) Special, Dr. C. A. Veasey, Jr.

"Effect of Diet on Teeth and Jaws of Growing Animals." Dr. Willard C. Fleming, Oakland, Calif. Experimental Findings of the California Stomatologic Research Group, University of California. This paper was illustrated by lantern slides and one reel of motion pictures.

### WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., J. T. Rooks; Secty., C. J. Johanneson

The regular monthly meeting of Walla Walla Valley Medical Society was held March 13, following a banquet at the Marcus Whitman Hotel, Walla Walla.

Dr. J. Earl Else of Portland discussed "Recurrent Goiter." An outline of cases of recurrence was presented, explaining the reason for failure in goiter surgery.

Dr. J. Tate Mason of Seattle gave an address on "Spinal Anesthesia," especially featuring sodium amytal. He explained the advantages and disadvantages over inhalation anesthesia, giving the caution that it should be employed only by an expert.

Dr. R. W. Smith of Walla Walla read a paper on "Local Anesthesia in General Surgery." This should be employed more extensively than at present. It can be used in many cases where general anesthesia is contraindicated.

## BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Hypertension and Nephritis. By Arthur M. Fishberg, M.D. Adjunct Attending Physician to Mount Sinai and Montefiore Hospitals, New York City. Illustrated with 33 Engravings and 1 Colored Plate. Cloth 566 pp. $6.50. Lea & Febiger, Philadelphia, 1930.

The author begins with a discussion of renal function. The chief sign of normal renal function is ability to concentrate the urine to normal specific gravity. A constant specific gravity not exceeding 1010 shows maximum damage of the kidneys and, no matter how poor the kidneys, they may be made to elaborate a urine of specific gravity of 1010 under proper conditions. The reviewer doubts if this is possible in the latter stages of polycystic disease of the kidneys.

The author states that the concentration test is the simplest and most accurate for determining renal function. The patient drinks one glass of water only at six o'clock dinner and abstains from all liquids till ten next morning. The urine passed at bedtime is discarded but the samples taken at 7 or 8 a.m. next morning are saved, and also at 9 and 10 a.m. These three specimens are kept in separate bottles and the specific gravities are taken. A normal urine should concentrate to a point over 1024 in one of these samples and may reach 1030. The 'phthalein test is inaccurate in heart failure and also in cases with impaired renal function with polyuria. The urea test is reliable but requires chemical analysis of the urine. In impairment of renal function the ability to excrete all the urinary constituents is uniformly diminished. It does not mean that some constituents of the urine are excreted more freely than others.

The distinction between renal insufficiency and impaired renal function is made. The former may occur with or without impairment of the latter. The criterion of renal insufficiency is retention of nitrogenous waste products in the blood. The test of renal impairment is failure in concentration of the urine. Ordinarily loss of renal function is overcome by polyuria, when compensation is established. Renal insufficiency is caused by great impairment of renal function; by inability of the kidneys to secrete properly through heart failure; and, lastly, by increase of waste products in the blood, as brought about by improper food or fevers, etc. The power of the kidneys to eliminate water is also diminished in impaired renal function. This may be tested by giving a patient three pints of water on an empty stomach in the morning, when all should be eliminated within four hours. The frequent presence of polyuria in chronic nephritis owing to hypertension obscures this form of renal impairment.

Failure of water secretion by the kidneys is very common in heart disease with edema, and with vomiting and diarrhea. The presence of albumin and casts in the urine, and even the high nitrogen findings in the blood, often misleads doctors into the diagnosis of renal disease. But in these pseudorenal conditions there is normal or high concentration of the urine, and the causes of renal disturbance are altogether extrarenal.

The author believes that estimation of blood urea is all sufficient, in accord with most able clinicians. The determination of the other urinary substances in the blood only causes added expense without increasing our knowledge. Maximum accumulation of urinary constituents in the blood is no sign of renal disease. When the kidneys are at fault, the specific gravity of the urine is low. If a person has been on a high protein diet for days, two or three days of a low protein diet are necessary before an accurate estimation of blood chemistry of renal function, such as comparisons of the blood urea content with that in the urine, etc., are not only unnecessary but are no more accurate than the simple determination of the specific gravity.

A most illuminating discussion of edema shows that it occurs from three causes: (1) diminished colloid osmotic pressure in the blood plasma, (2) increased permeability of the capillaries, (3) augmented hydrostatic pressure in the capillaries. The first and second amount to much the same thing because with increased permeability of the capillary wall protein molecules pass through into the tissues and, if the tissue fluid contains 2 per cent of protein and the plasma 7 per cent, the effective colloid osmotic pressure of the plasma proteins is but 5 per cent. The edema of chronic nephrosis and of the nephrotic form of glomerulonephritis is due to diminished colloid osmotic pressure of the plasma proteins. This condition is caused by the great loss of albumin in the urine, and the same state is seen in undernutrition. The third factor of augmented hydrostatic pressure in the capillaries is found chiefly in stasis from heart failure.

Chapters are given to hypertensive encephalopathy and retinitis, and it is pointed out that convulsions occur in the encephalopathy which are not uremic and in cases with normal renal function. Also hypertensive retinitis is a better term than albuminuric because it also is present in cases of essential hypertension and is probably due to ischemia of the retinal vessels.

The author's classification of renal disease, after Volhard and Fahr, consists of (1) benign albuminuria, (2) nephroses, larval, necrotizing, chronic and amyloid, (3) glomerulonephritis, focal nephritis and acute interstitial nephritis, (4) multiple glomeruloar embolization (subacute bacterial endocarditis), (5) essential hypertension, (6) senile arteriosclerotic kidney. There is a very complete and interesting discussion of benign albuminuria, diagnosis usually requiring long observation. The nephroses denote degeneration, chiefly of the epithelium of the tubules. The larval are seen in fevers and diabetes, and the necrotizing in mercury poisoning. The diagnosis of chronic nephrosis can only be made after protracted observation because glomerulonephritis often simulates it for long periods. But the occurrence of blood in the urine, hypertension or impairment of renal function will rule out nephrosis. It is a very rare disease but patients usually recover after years. A rich protein diet, thyroid extract, and salyrgan with ammonium nitrate are useful in treatment of the edema.

Acute glomerulonephritis is caused by the toxins of streptococcic infection and may be in part an allergic reaction. The main treatment is restriction of diet for some days to fruit juices in small amounts in opposition to the old method of great quantities of milk. Chronic glomerulonephritis is more apt to occur when there is a persistent focus of infection (tonsils) with repeated acute exacerbations of the renal trouble accompanying those in the primary focus. There is a most interesting clinical account of the various types of this chronic form of nephritis, including the nephrotic, nephritic and cardiac edema. The discussion of treatment is admirable. Focal nephritis is seen at the height of acute infections (tonsillitis) with hypertension, edema or impairment of renal function, due to presence of bacteria in the kidneys. The prognosis is excellent.

There are 135 pages devoted to essential hypertension and nowhere has the subject been presented more satisfactorily. While the term describes a hypertension which never originates in renal disease, and does not commonly terminate through failure of renal function, yet, on the other hand, the kidneys are damaged by arteriosclerosis in more than 90 per cent of cases at the time the disease runs its course. In less than 10 per cent of cases does loss of renal function and uremia cause death. These constitute malignant hypertension, in which for some unknown reason necrosis and endarteritis of the renal arterioles occur. Most malignant cases happen in the thirties and forties, while ordinary hypertension is more common after fifty, and the preponderance of glomerulonephritis is under thirty years of age.

Heart complications are so far the most common cause of death in hypertension. Fishberg quotes Bell and Clawson that only 10 per cent of hypertensive hearts are free from coronary sclerosis, that in 55 per cent the coronary disease is moderate, and in 35 per cent it is severe. Symptoms of coronary disease are, however, much more common in males, and much less fatal in females, as noted by William Mayo (reviewer). Symptoms simulating angina may be due to hypertension alone from strain on the heart or aorta

The various vascular complications of hypertension are reviewed in extenso. Cerebral hemorrhage occurs in from 7 to 14 per cent of cases, and cerebral arteriosclerosis is found in practically all at necropsy. Renal involvement is also considered in detail, and the effect of hypertension on the nervous system, blood, lungs, eyes, metabolism, etc. The prognosis of hypertension in women is vastly better than in men. In 76 cases Paullin found the mortality in men to be 54.1 per cent, as compared with 3.8 per cent in women, in the course of observation extending from five to seventeen years. The causes of death in 131 cases recorded by Christian and Bell in hypertension were 32 per cent from heart failure, 25 per cent from cerebral accidents, 25 per cent from independent conditions, and 4.5 per cent from renal disease. The section on treatment is as excellent as that of other parts of the work.

This book is one of the most outstanding of recent contributions to clinical medicine and the best work on nephritis and essential hypertension in the English language today. It is admirable in all respects, in its practical teaching, in its masterly complete clinical descriptions, in its sane, broad conceptions, and in its catholic appreciation and knowledge of all the important work and bibliography of the leaders in medicine throughout the world, as shown by constant quotations in the text and the enormous list of references at the close of each section. The work cannot be too highly commended. Winslow.

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Peptic Ulcer (Clinical Roentgenology with Case Reports). Annals of Roentgenology, Volume X. Two Hundred and Forty Roentgen Ray Studies and Forty-seven Clinical Illustrations. By Jacob Buckstein, M.D. Instructor in Gastrointestinal Roentgenology, Cornell University Medical College, etc. 337 pp. $12.00. Paul B. Hoeber, Inc., New York, 1930.

We are very fortunate to have this monograph presented by a man so well trained and thoroughly competent. The material is well arranged; there has been a very careful selection of representative cases and the condensed, well worded case histories, coupled with the author's personal check-up at operation, makes the volume of more than usual value. In addition to gastric and duodenal ulcers, which are usually only those included in peptic ulcers, the author has given us some very interesting material on gastrojejunal, jejunal ulcers and gastrojejuno-colic fistulae as well as esophageal involvements. By showing both the physiology and pathology he illustrates the complete evaluation of roentgen findings when properly interpreted. The importance of checking and rechecking of the gastrointestinal cases by both internist and surgeon is clearly shown. The work appears on heavy glazed paper, illustrated by numerous full page roentgenograms. This volume fills a need for a book of reference, where comparisons with definitely proven cases may be made. It will be found of great help to internists, surgeons and roentgenologists.

Garhart.

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Surgical Diagnosis. By 42 American Authors. Edited by Evarts A. Graham, M.D., Professor of Surgery, Washington University Medical School. Three Octavo Volumes, totaling 2750 pages, containing 1250 illustrations, and separate index volume. Philadelphia and London: W. B. Saunders Company, 1920. Cloth, $35.00 a set. Volumes I and II are now ready. Volume III and separate index volume ready March 15, 1930.

In the past, excellent works have appeared which treated the subject of surgical diagnosis from totally different angles. Each in itself supplied a demand. The present work, comprising three volumes of almost one thousand chapters each, is sufficiently comprehensive in type and scope to include all the forms in which the subject has heretofore been presented. Under the editorial direction of Evarts A. Graham, the forty-two authors responsible for the work have accomplished their purpose in a uniformity of manner which gives pleasing balance throughout. Chapter titles include wounds, postoperative complications, gynecologic diagnosis, diseases of face, mouth and jaws, joint diseases and injury, the skin and subcutaneous tissues, as well as many others.

Adequate description of disease enables the reader to get a comprehensive picture which includes in some instances etiology, pathology and even suggestions as to principles of treatment. Thus it is apparent that the physician as well as the surgeon is appealed to. Clinical features of disease have, of course, received the greatest emphasis, though a logical inclusion of laboratory and other methods is noted, the result being a very practical compilation on the subject of surgical diagnosis as practiced today. The illustrations are good, well chosen and adequate, though by no means lavish. They number twelve hundred and fifty. Although only two volumes are at present available the third is promised this month.

Forbes.

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Surgery at the New York Hospital One Hundred Years Ago. By Eugene H. Pool and Frank J. McGowan. Twenty-four Full Page Plates. 188 pp. $1.50. Paul B. Hoeber, Inc., New York, 1930.

To one fond of historical medical investigation this is a fascinating volume. The New York Hospital received a Royal Charter in 1771, being the second to be established in America, following the Pennsylvania Hospital founded in 1751 through the efforts of Benjamin Franklin. Surgeons of that day, like those of the present generation, realized their superiority over their predecessors, as indicated by the following quotations from Potts, in 1779: "No man, however slightly acquainted with the history of surgery, can have the slightest doubt of the superority which its present state justly claims over that of our predecessors. The surgery of the last century was coarse and cruel, painful and tedious. To simplify the art has been the aim of all the best practitioners of later times."

In the light of this opinion the treatment of the following case is interesting, taken from the "Surgical Register," covering the period 1808-1833, which has recently been discovered. A comedian entered the hospital September 18, 1811, with a compound fracture of tibia and simple fracture of fibula. The limb was placed upon the leg splint, well padded with tow, constantly wet with Jamaica spirits and water. On account of full and hard pulse seven hours later twelve ounces of blood were abstracted and the patient given eighty drops of laudanum for his pain. Five days later poultices of bread and milk were applied, which failed to induce suppuration. In the presence of gangrene soon appearing a yeast poultice was employed, to which bark was added after a day or two. Indications of infection promptly followed, the muscles of the jaw became rigid and after a consultation twenty drops of tincture of cantharides were given every two hours till eighty drops were administered to relax the neck of the bladder. Wine and laudanum were given freely to allay pain. In spite of these and many other kindly ministrations, the patient died with tetanus at the end of about two weeks.

There were many famous surgeons in New York during this century, whose portraits and biographies appear in this volume. The cases quoted show careful history taking according to the methods of the day and offer an accurate, interesting description of surgical procedures during that period.

Disorders of the Sexual Function in the Male and Female. By Max Huhner, M.D., Chief of Clinic, Genitourinary Department, Mount Sinai Hospital Dispensary, New York City. Third Edition. 342 pp. $3.00. F. A. Davis Co., Philadelphia, 1929.

The author makes a plea for closer cooperation between the urologist and neurologist, asserting that the present day urologist does not know enough about neurology to treat sexual disorders properly. He contends that sexology is a distinct specialty. The conditions considered are masturbation, impotency, frigidity, many other abnormalities of sexual function, enuresis, continence and dysmenorrhea. And although there are some repetitions which are disturbing to the reader, the ideas are simply and clearly expressed. The ability to simplify and to clarify a subject matter which is perplexing to many of us is no doubt due to the author's large experience with clinical cases of this type. To the practitioner, particularly the general practitioner who wishes to treat sexual disorders, this book should prove very valuable. O. A. Nelson.

The Bellevue Hospital Nomenclature of Diseases and Conditions. Revised by the Committee on Clinical Records. 232 pp. $3.00. Paul B. Hoeber, Inc., New York, 1930.

This volume has been revised every five years since the original issue of 1903. It represents the classification of diseases as employed in the department of hospitals in the city of New York. New diagnoses have been added and there are some new subdivisions, as Diseases of Allergy, Metabolism and Deficiency. The most radical change is noted in the cardiac section, in which appear anatomic, physiologic and etiologic diagnoses of diseases of the heart. If one desires information as to correct nomenclature of conditions data are available in this monograph.

Essentials of Medical Electricity. By Elkin Cumberbatch, M.A., B.M. (Oxon.), D.M.R.E. (Camb.), M.R.C.P. Medical Officer in Charge, Electrical Department, St. Bartholomew's Hospital, London, etc. Sixth Edition, Revised and Enlarged, with Eleven Plates and 116 Illustrations. 443 pp. $4.25. The C. V. Mosby Company, St. Louis, 1929.

This is one of the best volumes on the use of electricity in medicine which can be studied by the seeker for information in this line of practice. The principles of the electric current and its general application in medicine are explained in detail. About half the book is devoted to the galvanic current, which is the basis of all electric applications in the treatment of disease. The usefulness of this current is little understood by the medical profession. In this volume its various applications in the treatment of diseases of the muscles, nerves and joints are clearly portrayed. Particular attention is given to ionization and the explanation of its role in electrotherapy. The sinusoidal currents are explained and their practical applications in connection with the galvanic current are clearly demonstrated. The important subject of testing electric reactions is discussed and its mysteries clarified. High frequency currents and diathermy are considered, the essential factors being briefly considered. The chapter on static current proves the importance of this agency in physical therapy. Diseases benefited by electric treatment are classified alphabetically with suggestions for the treatment of each. This book is worthy of careful study by anyone interested in this subject.

Tonsil Surgery Based on a Study of the Anatomy. By Robert H. Fowler, M.D., Chief Surgeon of the Tonsil Hospital, New York, etc. 103 Illustrations, including 10 Full-page Color Plates. 287 pp., $10.00. F. A. Davis Company, Philadelphia. 1930.

This is by far the best work on this subject the reviewer has ever read. The public is beginning to appreciate the difference between good and bad tonsil operations. An increasing demand arises for work that is of the highest quality. There are too many hemorrhages, too many secondary operations, too many mutilated throats. These can be traced back to two things, the idea that the tonsil operation is easy, and the fact that many who do the surgical work have received poor instruction.

The method of illustration of the various operative procedures is exceptionally good. The author has gone in detail into the physiology and anatomy, including the blood supply and relations with neighboring structures. Many views are presented and the reader can figure out a happy medium. No one operator is superlative. Rather, the differences are slight in comparison with the resemblance which covers the vital matters. Here is more information about operations that are excellent than has been made available in the literature heretofore. Patrick.

Roentgenographic Technique. A Manual for Physicians, Students and Technicians. By Darmon Artelle Rhinehardt, A.M., M.D. Professor of Roentgenology and Applied Anatomy, School of Medicine, University of Kansas, etc. With 159 Illustrations. 388 pp. $5.50. Lea & Febiger, Philadelphia, 1930.

The increasing importance of a more practical knowledge of the use of roentgen rays in the practice of medicine makes a book of this kind a real necessity. Several chapters covering a description of roentgen rays, roentgen machines and an explanation of various electric circuits are remarkably clear and lucid, being well illustrated. The advantages of a basic technique and means for devising a practical one, adapted to any equipment, are fully covered. A thickness-voltage chart prepared by the author is of real value in any procedure. Many experiments with paraffin blocks greatly aid one in understanding the physics of roentgen rays.

Farther along the author discusses a practical exposure technique and applies it to regional parts under various conditions. Considerable attention is paid to the use of intensifying screens and the Potter-Bucky diaphragm. Rules are given for correlating time, voltage, distance, screens and diaphragm to thickness of tissue, in order to get the proper exposure under all conditions. The work is brief, concise, sufficiently comprehensive for all practical purposes, and the subject matter is arranged nicely for reference. Snively.

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Laboratory Methods of the United States Army. Edited by Charles F. Craig, M.A., M.D., Colonel, Medical Corps, United States Army. Illustrated. 696 pp. $3.50. Lea & Febiger, Philadelphia, 1929.

This manual presents all laboratory methods used in the laboratories of the Medical Department of the Army and the Army Medical School. There are twelve parts, representing clinical pathologic, general bacteriologic and special bacteriologic methods. Other parts deal with examination of water and sewage, of milk, butter and lard. Chapters are offered on protozoologic, helmintbologic, entomologic, pathologic and veterinary laboratory methods. The latest and most approved forms of technic are available in this volume.

Surgical Clinics of North America (Mayo Clinic Number—Feb. 1930), Vol. 10, No. 1. 174 pp., with 82 illustrations. Paper, $12.00 per clinic year; Cloth, $16.00 per clinic year. (Issued serially, one number every other month.) W. B. Saunders Company, Philadelphia and London.

This volume contains the usual number of clinical reports of great interest and value that always emanate from the Mayo Clinic. Different members of the staff present reports of surgical procedure on the intestinal tract and abdominal organs. Treatment of fractures and operations on other bone diseases are offered in goodly number. New and Figi present a number of cases of neoplasms of the soft tissues of the face and neck treated by combinations of electrocoagulation, radium and incision, giving timely suggestions for cases of this sort. These volumes are always well worth the time of their perusal.

## PRIZE FOR GOITER THESIS

Beginning this year the American Association for the Study of Goiter will award a cash prize of $300 annually for the best original thesis dealing with some phase of the goiter problem. These should be submitted by June 1, to Doctor Walter M. Simpson, Chairman of the Essay Committee, Miami Valley Hospital, Dayton, Ohio. The award will be given immediately following the coming meeting of the Association which is to be held in Seattle, Washington, July 10-12, 1930.

Clinical Studies of Rheumatic Heart Disease. Forty white and eighteen colored persons comprised the group studied by Bernard A. Schwarz, Cincinnati (*Journal A.M.A.*, March 22, 1930). Forty were under the age of 16 and twelve between the ages of 16 and 35. Six patients were over 35 years of age. One-half of the fifty-eight patients gave a definite history of acute rheumatic fever with an average loss of time from school or work of seven weeks. The longest period of time lost was eight months, and the shortest, two weeks. One-half of this group with a history of acute rheumatic fever had had one or more attacks before the age of 13. The remaining half, with no history of acute rheumatic fever, gave a definite history of repeated attacks of sore throat in seventeen instances, of growing pains in eight instances, and of chorea in five instances. The familial incidence of rheumatic heart disease was limited to one case. There were twenty-five who had had tonsillectomy, of whom eleven gave a definite history of rheumatic fever, and nine out of the eleven had had recurrent attacks of acute rheumatic fever after tonsillectomy. The anatomic distribution of heart lesions was as follows: Fifty-one patients showed mitral valve involvement; three showed aortic valve involvement; one had aortic and mitral valve involvements, while three had no valvular involvement. Of the fifty-one cases of mitral valve involvement, thirty-six were insufficiency, seven stenosis, and six insufficiency and stenosis combined. In twenty of the total number in the group roentgenograms were made, with a negative report in seven instances. Thirty-four patients had electrocardiograms, of which seven showed marked right ventricular preponderance. thirteen left ventricular preponderance, three an occasional extrasystole, one auricular fibrillation, five notched P waves, and two delayed auricular ventricular conduction time. It has been clearly kept in mind that, in the great majority of cases, the manifestations of cardiac abnormalities do not constitute distinct disease entities but rather present local evidence of general systemic disease. He has divided these cases of rheumatic heart disease into two classes: Class A comprises the arrested cases which offer a favorable prognosis and in which, with proper management, there is apparently a normal span of life. Class B is made up of those having recurrent attacks of acute rheumatic fever which finally prove fatal. From the social side of heart disease, such a grouping is important because much time and effort can be spared if one centers attention on rehabilitation and on otherwise adjusting the lives of those with a favorable prognosis.

Recent Advances in Physiology of Menstruation. Emil Novak, Baltimore (*Journal A. M. A.*, March 22, 1930), is of the opinion that radical adjustments must be made in our views as to the physiology of menstruation because of the important new developments in this field. There is little doubt that in lower animals the sex cycle can occur independently of ovulation. The best evidence along this line has come from observations on monkeys, which menstruate much as do human females. Menstruation without preceding ovulation is certainly not the rule in women, but there is reason to believe that it occurs at times, though the associated endometrial cycle would naturally be different in such cases. Even if preceding ovulation is the rule, it is not certain that the two are related in the nature of cause and effect. The time has come when the doctrine of the "primacy of the ovum" in the regulation of menstrual periodicity must be abandoned. The evidence brought together in this paper makes it no longer tenable. There is no reason to believe that any other constituent of the ovarian structure is any more important in this respect, but there is evidence to suggest, though not to demonstrate, that the pituitary may, by the probable periodicity of its own function, be the regulator of the menstrual rhythm. This, however, carries the problem only one step toward its solution, for it raises the question of what determines the periodicity of the pituitary, and still leaves the question of menstrual periodicity one of the mysteries of life. The dual nature of the ovarian secretion has been definitely established, the "clincher" having been recently applied by the demonstration of an active corpus luteum extract, with properties in some respects antagonistic, in others supplementary, to those of the already well recognized ovarian follicle hormone. Evidence has thus accumulated to indicate that the latter is not to be regarded as *the* "female sex hormone." For that matter, the anterior pituitary secretion appears to play an even more fundamental role in sex physiology. For various reasons, especially the fact that the characteristic secretion of the corpus luteum has very different properties from those of the follicle and the placenta, the term "gestational gland," to include these three structures, is incorrect, and should be abandoned. The most important recent contribution to sex physiology, and the one which promises most in its future practical applications, is the discovery that the anterior pituitary constitutes the "motor" of the ovary. The surprising effects of implantations of the anterior lobe on the growth and maturation of the follicular apparatus open up a vast field of possibilities. Although the discovery of the follicle hormone has as yet yielded almost nothing from a therapeutic standpoint, there is reason to feel that the discovery of the underlying role of the anterior pituitary secretion may, in the future, be more productive of results in the treatment of disorders of the sex cycle.

# NORTHWEST MEDICINE

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## ORIGINAL CONTRIBUTIONS

### SPINAL ANESTHESIA *

WALTER KELTON, M.D.
SEATTLE, WASH.

The history of anesthesia reveals that various forms of this adjuvant to surgery have come and gone and many of the different drugs used in anesthesia have had their day. It also discloses that the several methods of inducing anesthesia and the various drugs employed have all had their zealous advocates and their strong opponents. Perhaps no type of anesthesia has had more adverse criticism than spinal. This was probably due to certain unfortunate experiences in the early period of its use. Critics of the method commented widely and unfavorably on these experiences; the consequence was general condemnation of this form of anesthesia. Thus it happened that spinal anesthesia, after having a more or less widespread trial about eighteen years ago, was practically discarded.

No ideal anesthetic has so far been discovered. None has been found which can be given with absolute safety, which will produce uniform and successful anesthesia, and will be entirely free from the possibility of unpleasant effects, such as shock, nausea, vomiting and distention. In the past few years spinal anesthesia has again come forward. With refinements in technic in the laboratories supplying the drug, with improvements in the drug itself, with better understanding of the method and better technic on the part of the surgeon, spinal anesthesia has made tremendous strides and is now a well accepted form of anesthetic.

For the first few years in the recent development of this method of anesthesia, stovaine was the drug most generally used. But in many cases it proved to be a shock to the patient, occasioned alarm to the surgeon, too frequently produced near-death and occasionally death; consequently other drugs were sought. Novocaine in stock solution was tried and this at times was found to be toxic. Spinocaine was given a trial and it became, and still is one of the favored drugs. But the drug which has thus far proved most dependable to produce anesthesia, with few of the complications and dangers experienced with other drugs, is novocaine in crystal form, prepared in ampules by the Metz laboratory. On the whole, it is the most satisfactory drug for the purpose yet found.

Our interest in spinal anesthesia began when it was being given a trial sixteen or eighteen years ago, but our enthusiasm was checked by adverse criticism. Later our interest revived, when this method of anesthesia again began to come forward and we availed ourselves of an opportunity, in the service of the King County charity hospital, to give it a thorough trial. Through this medium and the cooperation of some of the other hospitals we are able to present a series of 927 cases, covering a period of the last four years.

In these cases patients ranged in age from twelve

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* Read before Lewis County Medical Society, Centralia, Wash., Feb. 10, 1930.

to eighty-six years and the operations were of virtually every kind below the diaphragm. Among them were amputations, many cholecystectomies, nephrectomies, and such stomach operations as gastroenterostomy, pylorectomy and partial gastrectomy. Four Hibb's-fusion operations, involving the fourth, sixth, and seventh dorsal vertebrae, were performed recently, the anesthetic having been introduced as high as the third dorsal space (Wyckoff and Kelton).

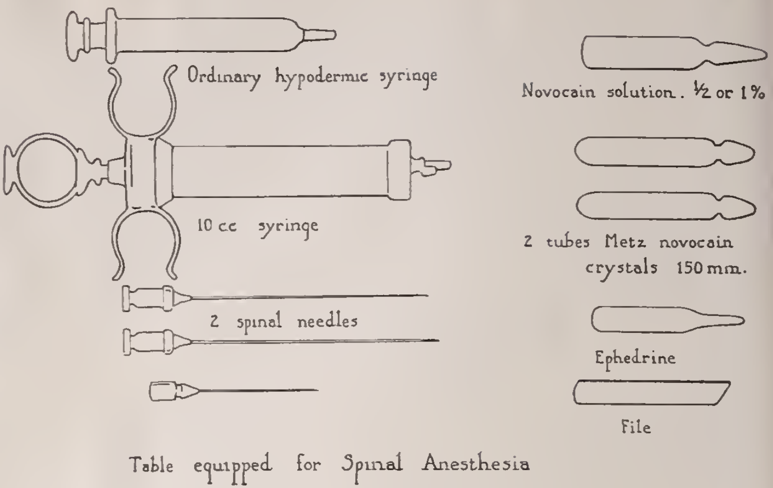
Ordinary hypodermic syringe
10 cc syringe
2 spinal needles
Novocain solution. ½ or 1%
2 tubes Metz novocain crystals 150 mm.
Ephedrine
File
Table equipped for Spinal Anesthesia

Fig. 1. Equipment for anesthetic table.

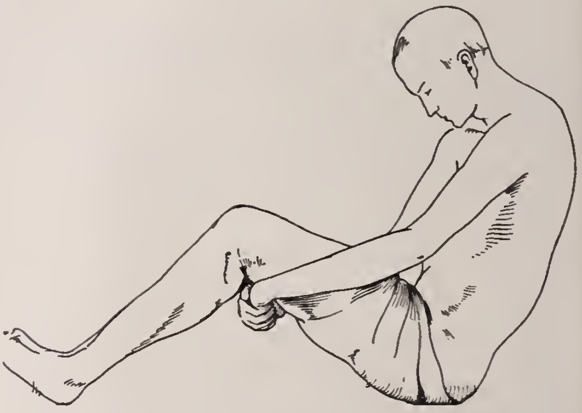

Fig. 2. Position of patient on table for administration of spinal anesthetic.

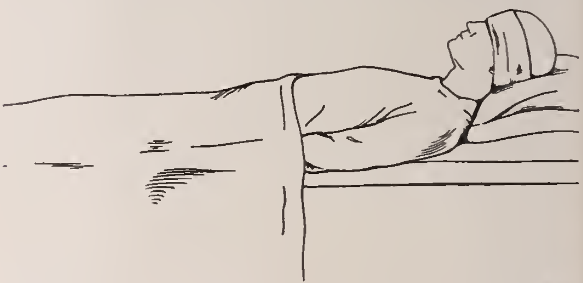

Fig. 3. Position of patient on table for operation. Note elevation of head.

Certain writers on spinal anesthesia urge the selection of patients. In their opinion a few types, notably those with Low blood pressure, are not fit subjects for spinal anesthesia. In our series of cases we have iven it for many major operations upon patients with systolic blood pressures of 110, and in two with pressures of 100 with no unpleasant effects.

Some writers on this subject stress the point that it is not safe to perform operations above the diaphragm with this method of anesthesia, but in our experience none of our cases have been more satisfactory than the four upper dorsal Hibb's-fusion operations. In this connection it should be borne in mind that Jonessco reported having done many operations above the diaphragm, including goiter operations.

As to technic, we can not give much detail, but the artist's drawings will show the equipment necessary, the position of the patient for giving the drug, and his proper position after the anesthetic has been given.

Figure 1 shows the arrangement of the anesthetic table. The equipment consists of an ordinary hypodermic syringe, a stock solution of novocaine for the purpose of anesthetizing the skin and soft tissues down to the spinal canal, a 10 c.c. syringe, two spinal needles, ephedrine and the novocaine crystals.

Figure 2 shows the position of the patient which we have found most satisfactory for giving the drug, because it permits complete forward bending. He is seated lengthwise on the table with the hands hooked underneath the thighs.

With the patient's position as shown in figure 2, the stock solution of novocaine is injected into the skin and soft tissues, after which the spinal needle is inserted in the selected interspace, the spinal fluid being allowed to flow drop by drop into the tube containing the crystals. The other spinal needle is used to stir the crystals until they are dissolved. This solution is then slowly introduced into the spinal canal, the plunger being carefully slipped backward and forward for the purpose of being sure that the fluid is entering the canal. We cannot emphasize too strongly the importance of a free flow of the spinal fluid. If this does not flow freely, the needle is not in the canal and the anesthetic will not be effective. As soon as the drug has been introduced, an ampule of ephedrine is given subcutaneously by the nurse and the patient is placed on his back with the head elevated, as shown in figure 3.

We wish to make it clear that we do not tell the patient anything about the anesthetic to be used (Forbes' method). It has not been the custom of surgeons to discuss with their patients questions relating to anesthetics or other details of technic connected with operations. We believe it is best the patient should not know that spinal anesthesia is to be used, because such knowledge usually invites the expression of numerous opinions based chiefly on rumor, the effect of which very often is a disturbed state of mind.

The patient is told that it will require half an hour or more for the general preparation, that is, the cleansing of hands and the field of operation and preparation of instruments. A nurse at the head of the table then engages him in conversation. His mind is at ease while he thinks the preliminary preparations are in progress, and in many cases the operation is finished without his realizing that it had begun.

A summary of events in our series of cases is shown in table 1. It will be observed that stovaine was used in 330 of these cases, but of late that drug has been practically discarded in spinal anesthesia and at this time novocaine in crystal form is being used almost exclusively.

Regarding supplemental anesthesia, we have this to say. In some cases a supplemental anesthetic is given, when additional anesthesia is not necessary. The purpose of this procedure is to divert the patient's mind and to encourage the impression that he is being anesthetized by ether or other inhalation anesthetic. This is particularly valuable if the patient is nervous. Of course, it is not necessary to produce complete anesthesia by supplemental means.

We have attempted to record all cases of shock under the two headings, "mild" and "severe." Under the heading "severe" we have recorded those cases in which the blood pressure dropped to an almost imperceptibly low point and the patient was not responsive to questioning. Under the heading "mild" we have listed those cases in which there was no alarm but such shock, as would have occurred under any form of anesthesia.

It will be noted in these cases that adrenalin predominates as a stimulant when one is called for. This was the drug most generally used as a stimulant during the early period of the development of spinal anesthesia, but it has been largely supplanted by ephedrine. In patients with low blood pressure it is of paramount important to give intravenous saline at the beginning of the operation, at which time adrenalin or ephedrine may be introduced through the tubing. Ephedrine is the ideal stimulant and should be on hand in every case. If this is given, adrenalin should not be used as a supplementary stimulant, but strychnine, camphor or caffeine should be given if needed, or occasionally a repetition of ephedrine. In this series we omitted, for the purpose of observation, the use of ephedrine or other stimulant in approximately forty cases with no ill effects.

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|---|---|
| DRUG USED | |
| Stovain | 330 |
| Spinocain | 183 |
| Novocaine crystals | 365 |
| Procaine | 11 |
| Drug used not recorded | 38 |
| SUPPLEMENTAL ANESTHETICS | |
| Ether | 94 |
| Local infiltration | 77 |
| $N_2O$-O | 107 |
| $N_2O$-$O_2$-E | 31 |
| Sod. amytal | 9 |
| Ethylene | 10 |
| SHOCK | |
| Mild | 105 |
| Severe | 14 |
| STIMULANTS | |
| Adrenalin | 137 |
| Caffeine sod. benzoate | 46 |
| Ephedrine | 106 |
| Strychnine | 11 |
| Oxygen or gas oxygen | 10 |
| COMPLICATIONS | |
| Headache | 6 |
| Backache | 2 |
| Nausea | 14 |
| Vomiting | 6 |
| Fainting | 5 |
| Fainting before administration of drug | 1 |
| Gas | 2 |
| Distention | 1 |
| Meningeal irritation | 2 |
| Pain down legs | 1 |
| Hysteria | 3 |
| Extreme nervousness | 1 |
| DEATHS | |
| Immediate | 3 |
| Subsequent | 22 |

A collection of cases from widely separated sources, showing end results:

| | | |
|---|---|---|
| Strauss | 22,717 cases, | one death in 498 |
| Chiene | 12,000 cases, | one death in 570 |
| Jonessco | 1,005 cases, | no deaths |
| Chaput | 7,000 cases, | no deaths |
| Kelton | 927 cases, | three deaths |

TABLE 1

As to the complications arising from spinal anesthesia, we have observed that there are about the same varieties as occur with other methods, though comparatively far less nausea, vomiting, distention, backache, headache, pneumonia and postoperative ileus were noted in these cases. We might mention what we regard as two great advantages in the use of spinal anesthesia. One of these is that the patients are far less ill than with other methods; the other, almost a total absence of postoperative adhesions which generally are the result of sponge packing. Another great advantage may be deduced from the fact that, because of the easier and more effective suturing of the abdominal wall before recovery of muscular tone, we found postoperative incisional hernia very rarely in this series of cases.

We had three patients who were nauseated and vomited prior to the administration of the spinal anesthetic. In two of these we interpreted this condition to mean nervousness at the thought of the operation. In the other patient we felt certain the condition was due to an idiosyncracy to morphine which was given prior to the anesthetic. In one patient the vomiting was more or less severe for four days and it was very difficult to bring about activity of the bowels.

We have recorded one case of nervousness as possibly due to this method of anesthesia. However, the case was one of crushing injury to the leg, followed by eight months of osteomyelitis with a high range of temperature, amputation of the leg and a secondary amputation, and it may be that this grave and prolonged illness was the responsible factor in producing the nervous condition.

In one case included in our series, the blood pressure had just been taken and recorded at 140, the patient having been in excellent condition up to that point. Hardly had this reading been given to the surgeon, when the pillows were accidentally knocked from under the patient's head, allowing it to drop slightly below the body level, and half a minute or more elapsed before the head was re-elevated. The blood pressure was immediately taken again and recorded at 70, and it went down rapidly to 20. Two days thereafter we had another experience similar to this one in some respects, in another case in the same hospital. The patient was middle-aged and robust. At the beginning of the operation the blood pressure was recorded at 145, but it rapidly dropped to almost zero. In each of these cases there were no contraindications to the employment of spinal anesthesia, both patients being vigorous.

Contrasting with the record in these two cases was that in an operation we performed in a different hospital a short time afterwards. The patient was a woman weighing less than 100 pounds, who had been bedridden for more than a month before the operation and whose blood pressure was 100. In that case there was not the slightest difficulty with the anesthetic and the blood pressure at the end of the operation was 110. All of these experiences serve to convince us that the laboratories, in preparing the novocaine crystals, do not have uniform success in eliminating the toxic elements in the drug.

The deaths which we are recording as due to spinal anesthetic are those which occurred in the operating room shortly after the administration of the drug. Those recorded as subsequent are such as might have resulted under any form of anesthesia, the deaths occurring from two to ten days following the operations and clearly not connected with the anesthetic. There is one possible exception, a case in which the patient had very low resistance and a variety of complications, including pneumonia and postoperative ileus.

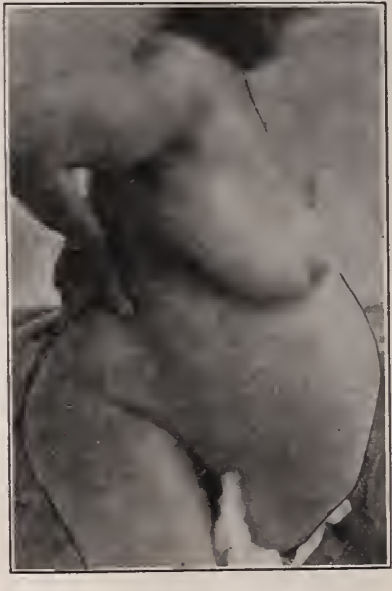

Fig. 4. Note size of abdominal tumor, pressure of which against diaphragm would obstruct respiration with inhalation anesthesia.

Figure 4 shows a case where no other form of anesthetic could be used with any degree of safety because of the tremendous pressure and the diminished breathing space. It is apparent that any inhalation anesthetic would have been fatal. This patient was 86 years of age and laughed and chattered with everyone in the operating room during the entire operation.

### SUMMARY AND CONCLUSIONS

1. Spinal anesthesia has finally come to proper recognition as perhaps the safest form of anesthetic. It is far easier for the surgeon, especially in abdominal surgery, because it permits complete relaxation and reduces the operating time almost one-half. There are fewer disagreeable postoperative results, such as nausea, vomiting, distention, head-

ache, backache, postoperative adhesions and postoperative incisional hernia. "It makes a poor operator look like a good one."

2. In the hands of an inexperienced surgeon spinal anesthesia is dangerous and ranks not far above chloroform. Some of the deaths recorded in spinal anesthesia are unquestionably the result, not of the drug but of inexperience on the part of the surgeon.

3. In the use of novocaine crystals as at present prepared, it is essential to have the head well elevated and to keep it there.

4. This depressent drug should never be administrated without having at hand and ready for instant use the necessary stimulants.

5. Since occasional shock is observed without any ascertainable cause, it is believed either that there is a marked idiosyncracy to novocaine on the part of some patients or in the preparation of the drug toxicity has not been eliminated.

6. It can be given to the very young, to the extremely old, to the asthenic, and to the patient with low blood pressure with as near absolute safety as any other drug.

7. Spinal anesthesia has still to suffer from the onslaught and attacks made upon it by its critics.

8. In view of the advances that have been made and the progress now going on in spinal anesthesia, it is believed and predicted that this form of anesthetic will rapidly become the one of choice in virtually all surgery except cranial.

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# SOME RECENT SURGICAL ADVANCES*

R. D. Forbes, M.D.

SEATTLE, WASH.

In the field of blood chemistry there were as many examinations made during the year 1929 at The Swedish Hospital of this city as there were during the preceding two years. This is pointedly indicative of the progress in standardization for diagnostic and preoperative treatment purposes. Recently more than ever there has been cooperation between the internist, the laboratory and the surgeon, in their efforts to assess the condition of the patient with regard to the function of vital organs and to carry him through to a final cure.

As a preanesthetic injection ergot has been recommended with morphine for its effect in giving tonus to unstriped muscle and maintaining vascular tone.

In the field of anesthesia sodium-amytal by intravenous injection has rapidly made a place for itself. Functioning as a narcotic in doses of 15 to 22½ grains, it minimizes shock and postoperative discomfort. Its drawbacks are few. Ethylene and gas oxygen maintain their popularity. Spinal anesthesia is in favor in its field and Mayo, Lahey, Graham, Babcock and Jackson have recently expressed themselves in its behalf as being the safest anesthetic for the patient, and the most comfortable for the surgeon in most of the operations below the umbilicus. It is a specific in cases of ileus and the anesthetic of choice in acute intestinal obstruction.

During prolonged operations, where shock and hemorrhage do or may supervene, it is of value to begin early the intravenous injection of a six per cent gum acacia solution. By slow administration shock may be prevented and where blood loss has occurred, a citrated blood solution may replace the gum acacia.

Postoperatively acknowledged general principles obtain. Bruce has described a colonic tube which is passed while the abdomen is open. Its upper end may reach the splenic flexure, while the lower end is sutured to the skin of the anus. Distention is prevented, fluids are easily given, and the sigmoid is draped in the best position for intestinal support.

For the prevention of postoperative embolus Walters has used thyroid extract in over 4500 cases. The incidence was one-third the previous percentage and then only in older people with known cardiovascular disease.

For the avoidance of atelectasis and minor forms of pneumonia in certain operations on the thoracic cavity and upper abdomen the administration of carbon dioxide and oxygen is effective for hyperventilation. It may be given three or four times daily, Graham and others using it routinely.

Toxic diseases of the thyroid gland have a confused pathology. That there is a relation in this type of disease between the nodular, colloid, adenomatous and hyperplastic forms is the final conclusion today. A clearer etiology alone will give a clearer pathologic understanding.

In the technic of thyroidectomy the more acute cases require the largest tissue removal, a temporary overcure being necessary for permanent results. During acute crises the administration of glucose, iodine, fluids and morphine is essential.

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* Read before a meeting of Seattle Surgical Society, Seattle, Wash., Feb. 28, 1930.

The duodenal tube has greatly aided the introduction of lugol's solution, where nausea, vomiting or diarrhea would otherwise have interfered.

Recent case reports describe states of acute hyperthyroidism, precipitated by major operations. Recognition is vital, as shock and hemorrhage are simulated. Lugol's solution produces dramatic response in the thyroid type.

The association of the parathyroids with such diseases as osteomalacia, osteitis fibrosa, osteitis deformans, multiple cystic bone tumors and ankylosing polyarthritis seems definitely established. Removal of tumors of these glands has produced rapid improvement in the bony pathology, while at the same time producing a more normal blood calcium content.

King has done research work to show the unsuspected locations and difficulty of recognition of the parathyroids. Lahey advocates, in goitre operations, examining the removed thyroid tissue for parathyroids. If found, they should be grafted into muscle.

Five adrenal tumors have now been removed in patients with paroxysmal hypertension, three being recorded in 1929. The operation is difficult but the mortality not high. Improvement of the hypertension has occurred with uniformity.

In the surgery of the chest removal of the phrenic nerve by improved methods is a standardized procedure. When done under fluoroscopic control the amount of diaphragmatic paralysis is known. Harrington recommends its removal in operations for diaphragmatic hernia, the immobilization induced being a great aid in the technic.

Thorocoplasty has a lowered mortality, due to more effective technical standardization. The graded type with discrimination in the number of ribs removed, working from below upwards, has proven its advantages. The patient who is bedridden before operation is found to be a poor risk. One good lung is essential and evidence of natural resistance to tuberculosis should be observable on the diseased side. The increasing percentage of cures in advanced cases is noted.

Graham reported a series of operations for the relief of certain types of cardiac decompensation. The removal of cartilages has released adhesions and eliminated cardiac pressure against the chest wall, with resulting improvement in certain cases of mediastinopericarditis.

Meyer, of Hamburg, reported his third operation for embolus in the pulmonary artery. His approach was through the pericardium and recovery followed.

For better diagnosis of breast tumors transillumination has been helpful. Mastitis, blood cysts, galactocele and cancer can be frequently differentiated by its use. Bloodgood adds that any caked breast not resolving or forming an abscess within ten days should be explored.

The report issued by the committee of the American College of Surgeons on breast cancer concluded that: (1) In primary cases roentgen rays have no value. (2) In conjunction with surgery the use of roentgen rays has not increased the number of five year cures. (3) In the treatment of distant metastases roentgen rays have little effect. (4) in the treatment of local recurrence the best results have been obtained by the employment of roentgen rays and radium.

Recent abdominal incisions are those of Sloan, Wilkie and Mason. Each is a decided help in the appropriate case.

Meyer advocates a chondroplastic resection of the costal arch for good exposure in high abdominal surgery. The diaphragm, liver, spleen and cardiac end of the stomach are easily and quickly exposed.

Varices in the lower esophagus are the seat of serious hemorrhages in cases of cirrhosis of the liver. To prevent their occurrence Walters has ligated the coronary vein. By suturing the lesser omentum to the falsiform ligament, fresh anastamosis was produced. His results have been encouraging but inconclusive.

Jordan, of the Lahey Clinic, has reported on 133 cases of stomach ulceration, where the diagnosis was clarified by roentgenography during the course of medical treatment. For the diagnosis of a benign lesion she insists on (1) complete radiographic disappearance with normal pliability of gastric wall, (2) complete clinical relief, (3) the disappearance of occult blood from the stools. Where a minute radiologic defect persists, as in some cases of callous ulcer, surgery is indicated for cure.

A relationship between the size and pathology of ulcer is fairly constant; eighty per cent of simple ulcers are smaller than a quarter, never larger than a dollar. Only twenty-five per cent of malignant ulcers are smaller than a quarter. Therefore, if smaller than a quarter, the chances are ten to one it is benign; if larger than a quarter, the chances are two to one it is malignant.

Controversy is still rife regarding the surgical treatment of duodenal ulceration. Partial gastric resection does not always reduce the acids sufficiently and more than one hundred cases are recorded, where jejunal ulceration has followed at the line of anastomosis. The mortality is high, especially in the hands of the average surgeon. Alternative procedures, as local excision with pyloroplasty or local treatment with gastroenterostomy, have shown satisfactory end-results, with an insignificant mortality when properly and appropriately performed. A definite advance in this form of surgery is its consideration as only a part of the management.

Essential factors for success with gastroenterostomy are the following: (1) The removal of septic foci, especially in the upper respiratory passages. (2) Improvement of the patient's general condition. (3) Preoperative medical treatment to the point of at least two recurrences in otherwise uncomplicated cases. (4) Examination at operation of other abdominal organs which may have a causative connection with symptoms or pathology. (5) Demonstrability of an actual ulcer. (6) Local treatment of the ulcer by excision or infolding. (7) A technically correct anastomosis. (8) Adequate postoperative treatment and observation.

In certain types of cancer of the stomach, where no obvious metastases are present but where the size or fixity of the lesion prevents its removal, Chamberlain has used deep roentgen therapy at the operating table. Six weeks later a much contracted and loosened growth was easily removed. He has reported two cases alive after five years.

The high mortality of acute intestinal obstruction has been lowered by the administration of the antitoxin of the bacillus Welchii. It is effective in combating the toxemia. In many forms of septic appendicitis, associated with paralytic obstruction, it is of equal value. In the above conditions the effect of sodium chloride administration has also been dramatically shown. The use of a five or ten per cent solution in glucose of equal strength is advocated. Even in the absence of obstructive symptoms the intense intoxication is neutralized by sodium chloride. After operations for acute intussuseption in children a twenty per cent solution has been given by rectum t.i.d. with benefit.

Hintze, of Berlin, has demonstrated the great value of roentgen rays in the diagnosis of acute intestinal obstruction. The exact location of the constriction can thus sometimes be determined. He states that (1) The fluid level is only present with occlusion. (2) A contracted segment has localizing value. (3) A fixed segment with an unchanging gas content is characteristic of a strangulated loop.

The problem of the recurrent stone after cholecystectomy has received much attention. In sixty-seven autopsies, where an operation for stones in the gallbladder had preceded death, Young found stones in the ducts of sixty per cent. His findings are moderated by the explanation that the condition of the patient would have made further exploration inadvisable in all but 15 per cent. Lahey explores the ducts in over 20 per cent.

The use of diathermy through the liver region during serious operations within the abdomen is advocated by Crile and Deaver. They consider it a vital factor in the reduction of shock and postoperative pneumonia.

Postoperative biliary fistulae of more than three weeks standing have been injected with lipiodol by Ginzberg. Roentgen studies have been illuminating in the demonstration of points of obstruction and extent of tract outlined. The consequent suggestion for treatment has sometimes been of the greatest help.

As a cause of abdominal pain, simulating gallbladder or appendiceal disease, undulant fever is now demanding attention. In a review of one thousand case histories Simpson found that one-fourth of them suffered abdominal pain as an outstanding complaint. Needless surgery had preceded the diagnosis of undulant fever in a number of these. The symptoms are usually sufficiently characteristic for diagnosis.

There are prospects of reducing the occurrence of postoperative adhesions by the use of "amniotic fluid concentrate." The solution is furnished by Lilly & Company for clinical trial. Trusler, of Indianapolis, has experimented with guinea pigs as well as using it in some clinical cases. Johnson, of Boston, has used it clinically with what he considers good results. It works by stimulating the rapid production of normal healing of the peritoneum.

Acute edema of the pancreas has been classified by Archibald in a recent number of *Annals of Surgery* as a new clinical entity. It has been recognized by pathologists as a stage in the development of acute pancreatic necrosis, but, according to Archibald, in a large number of patients resolution will often follow the stage of acute edema. The symptoms are those of severe epigastric pain, referred to the left and through to the back. The pain is violent in many cases and shock may quickly supervene.

Differentiation is necessary from a host of conditions which may simulate it, but in a typical case there is little difficulty. The history usually tells of one of two mild preceding attacks; examination of the abdomen shows epigastric tenderness roughly outlining the pancreatic region; there is a characteristic tenseness of the muscles, but board-like rigidity is rarely seen; due to pressure on the solar plexus the pulse is slow and the temperature usually depressed.

The laboratory is a great aid in determining early hyperglycemia. The presence of amylase or diastase in the blood in excessive quantity is a constant finding. Knowledge of the condition is important. When a diagnosis of gallbladder disease or other lesion has led the surgeon to open the abdomen, finding the diagnosis to be incorrect, investigation of the pancreas would disclose the source of the trouble.

When operation is early, the bloody fluid and areas of fatty necrosis so characteristic of a later stage of pancreatitis are absent. In the treatment it is sufficient to split the pancreatic capsule and provide adequate drainage. Even when the diagnosis is accurately made, operation is indicated so that graver forms of pancreatitis may not develop.

The method of treating varicose veins by injection, usually so satisfactory, has complications often overlooked. Ulcers have formed at the point of injection without apparent cause. Where quinine has been used uterine cramps have followed and cases of abortion have been reported in women where pregnancy was not suspected.

The salines and sugars are preferred by most surgeons, though pure phenol in three or four drop doses works excellently. A solution of sodium morrhuate is lauded by English surgeons who contend that it has all the virtures and no defects, frequently all the necessary injections being made at one sitting. This solution is not yet available in this country.

In recent months electrosurgery has established itself in the practice of many surgeons with the greatest firmness. For several years its employment in the hands of a few has given satisfaction, but its recent popularity has probably followed the development by the manufacturers of a higher type of mechanical equipment. The modern unit has made it possible to perform miracles of surgery in hitherto inaccessible brain tumors. A method of removing these tumors by scallops, with the final extraction of the collapsed shell, has been developed through electrosurgery. A modern unit also provides many forms of current, so that cutting, cooking and coagulating are equally available. Experienced men insist that familiarity with the machine is an important step in the doing of good surgery.

The treatment of Reynaud's disease by resection of the upper thoracic and lumbar sympathetic ganglia and trunks has been described by Adson and Brown. Illustrations are presented of the bluish or cyanotic color in the foot and hand changing to a normal pink following a successful operation. The diagnosis is important, as in cases of thromboangiitis obliterans with vasospasm, and in disturbances occurring in older persons, the associated vasospastic condition is not sufficient to justify the operation.

The operative technic is described with clearness and the results of surgery are tabulated with much detail. The authors conclude that vasodilation will be maintained for years following operation and that complete relief from the signs and symptoms of the disease can be expected.

In certain forms of chronic arthritis equally satisfactory results have followed this operation in both the upper and lower extremities. Patients treated were selected with care and were those who showed some relief from other measures, such as heat, diathermy and vaccines, which also act by increasing vasodilation. Patients sufficiently relieved by other forms of treatment and those in whose joints bony changes have occurred were not selected. The striking, maintained and unequivocal therapeutic effects of lumbar and dorsal sympathetic ganglionectomy in Reynaud's disease and certain forms of chronic arthritis seem to warrant the belief that surgical control in these diseases is an accomplished fact.

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BILIARY TRACT DRAINAGE. In a comparison of the intraduodenal concentrations of magnesium sulphate after administration of the drug by Lyon's method and after its oral administration in saturated solution, higher average concentrations of the salt were found in the latter case by John Tilden Howard, Baltimore (*Journal A.M.A.*, April 5, 1930); in fact, the maximum concentration when the salt is given orally usually exceeds the maximum concentration in the duodenum when magnesium sulphate is given by Lyon's technic, he asserts. High concentrations of magnesium sulphate are maintained longer in the duodenum by the oral method than after a single stimulation by Lyon's method. Chemical opinion and data contradict the view that magnesium sulphate in concentrated solution is appreciably changed by passage through the stomach except for dilution. Objections to the drainage of bile through the intestinal tube are discussed.

# PARTIAL URETHRECTOMY AND URETHROPLASTY

## IN TREATMENT OF STRICTURES OF THE URETHRA

ALEXANDER B. HEPLER, M.D.
SEATTLE, WASH.

The subject of urethral strictures is a commonplace one and has been given comparatively little attention in recent urologic literature. The treatment has been governed by firmly established standards which have changed little in the last fifteen or twenty years and is apparently a closed book. "Dilatations first, dilatations always" has been axiomatic, while operative enterprise has been largely occupied with procedures, usually external urethrotomy, designed to facilitate or render possible subsequent treatment by dilatations.

However, in many instances these methods, no matter how efficiently applied, are unsatisfactory. There are many patients with severe, inflammatory strictures, who keep returning year after year, in whom the slightest neglect of treatment results in recontraction and varying degrees of urinary retention with infection and progressive kidney damage. Many of them have had repeated perineal sections and external urethrotomies with no lasting benefit. The treatment of old, traumatic strictures by dilatation and external urethrotomy is notoriously unsatisfactory. For this reason I want to call attention to the possibility of effecting a relative cure of permanent duration by a wide resection of the urethra in certain types of strictures, a fact which has received greater recognition abroad than in this country.

Excision or resection of strictures has never been very generally practiced, first, on account of fear of the perineum but chiefly because of a natural apprehension that extensive operations on the urethra will result in scarring and recontraction, which would be as bad as the original stricture. In other words, one stricture would be replaced by another and continuous dilatation would be necessary.

This misconception is based on the results which follow external urethrotomy. This is often an emergency procedure, done with no hope for a cure but simply to provide for perineal drainage of the bladder and to permit subsequent treatment by sounds. The strictures are cut through and not cut out, so that the engendering factors, urethral and periurethral inflammation and infiltration, are left behind to produce subsequent contraction, unless it is prevented by continuous, systematic dilatation and this is not always possible or successful.

The operation is done through a median incision which does not provide good exposure. The bulb is incised and the urethra opened on a sound. The operation, when performed without a guide, is tedious and much time has been spent in looking for a passage through the stricture. Suprapubic cystotomy with retrograde catheterization is often necessary. The object of this at times most formidable procedure is simply to cut through a mass of inflammatory and scar tissue or to drain the bladder. In view of the fact that this can never be of lasting benefit and is not done with the hope of effecting a cure, operations that are logical to this end have been devised. I feel sure that, if the results of resection and excision of all the involved area were more generally appreciated, it would entirely replace external urethrotomy and also become the treatment of choice in many of the difficult cases which are now subjected to continuous dilatations.

The underlying principle of the surgical treatment of strictures is wide exposure by perineal dissection and resection of the urethra with excision of the entire involved area, thus doing away with the factors that are responsible for recontraction. Wide excisions are possible because of the urethra's remarkable capacity for spontaneous repair. If the continuity of the mucosa is not entirely destroyed and a strip is left along the roof to act as a center for epithelialization, then the gap will be filled in with remarkable rapidity. This natural replacement is so effective that extensive plastic operations, which attempt to make a continuous tube of mucous membrane, are not necessary. After a few postoperative dilatations the urethra will maintain its normal caliber with little or no contraction even after a period of one or two years.

This principle of urethral surgery has received greater recognition abroad than in this country. In Konig's Clinic urethrectomy was the method of choice in all severe strictures. Resection has been extensively practiced at the Necker Hospital by Guyon, Albarran, Lequeu and Marion. Hamilton Russel of Australia is an enthusiastic advocate of excision and has extended its indications to include all cases which require prolonged and patient attempts to get an instrument through a tight stricture. In this country Cabot, Maximmilian Stern and McGowan have recognized the value of excision and have devised operations for this purpose.

Stern has described an ingenious operation, applicable only to narrow strictures involving the bulbomembranous urethra. Its principles are employed with modifications to meet varying degrees of involvement and complications in the operation which I will describe.

1. The features of this operation to be emphasized are a wide exposure through an inverted Y incision with sharp dissection of the perineum and rectourethral space, including exposure of the urethra back of the triangular ligament.

2. Dissection of the bulb of the urethra off of the anterior layer of the triangular ligament rather than an incision through it as in external urethrotomy.

3. A wide excision of all inflammatory and scar tissue, no matter how extensive it may be. In many instances, particularly in traumatic strictures, this is made possible only by dissection of the recto-urethral space and exposure of the apex of the prostate.

4. The necessity for leaving a strip of mucosa on the roof to aid in the epithelialization of the reformed canal.

5. The reconstruction of the urethra by suturing the soft tissues of the perineum about a retention catheter.

### TECHNIC

Spinal or sacral anesthesia is used unless contraindicated. The patient is placed in the exaggerated lithotomy position in order to bring the perineum into a plane approximating the horizontal. A sound is passed down to the stricture or a filiform through it, if possible. An inverted Y shaped incision is made, the upper arm of which starts at the scrotoperineal junction. Lower arms extend nearly to the tuber ischii. The ischiorectal fossae are opened up to the apex of the prostate by blunt finger dissection, as in Young's perineal prostatectomy. Young's bifed retractor is inserted and the membranous urethra exposed by incising the central tendon and rectourethralis muscle. This is an important step, not included in Stern's technic, which makes the rest of the operation much easier and which is absolutely necessary in the extensive traumatic strictures or those complicated by fistulae and dense perineal scarring.

The bulbocavernous muscle is then divided along the median raphe and the flaps laid back from the bulb. The transversus perinei muscles are cut near their attachments to the base of the bulb, leaving on the stumps for suturing. It is now an easy matter to dissect the bulb up from the anterior layer of the triangular ligament as far as is necessary to expose the tip of the sound at the point of stricture. The urethra is then opened and the whole scarred area excised. At times this may require the removal of a portion of the posterior urethra. Because of the previous exposure, this can be done without finding the opening through the stricture. After the excision a catheter is passed to the bladder through the meatus and the defect in the urethra closed about it.

In those cases requiring this operation there is usually so much scarring and the loss of mucosa is usually so great that it is impossible to approximate the ends of the urethra, and interrupted transverse sutures are necessary to bring the normal perineal structures about the catheter. The wound is further closed by bringing the bulb back over the urethra and triangular ligament and reconstructing the central tendon by a single suture which passes through the stump of muscles on the bulb, the transversus perinei and sphincter ani. When this suture is tied, the structures are restored to their original positions. Suturing the bulbocavernous muscle completes the repair.

The excision, as just described, is applicable to the ordinary strictures at the bulbomembranous junction. In many cases, where there has been an old extravasation, the bulb is implicated in the scar and cannot be dissected cleanly from the triangular ligament. It is in these cases that the previous exposure of the membranous urethra and apex of the prostate is of special value. The urethra can be opened behind the stricture and by a forward dissection the mass of scar, including the urethra, perineal tissue and at times large portions of the bulb removed. This variation is particularly necessary in traumatic strictures which often involve the posterior urethra and have usually been complicated by extravasation with scarring of the deep perineum.

Postoperative treatment: The catheter is left in for five to seven days, if it can be tolerated that long. Many of these old strictured urethras tolerate an indwelling catheter extremely well. In some cases after the catheter is removed there is no urinary leakage, in others there is perineal drainage from three to ten days. No urethral injections are given. On the tenth day a No. 24 F. sound is passed. There are usually six to eight postoperative dilatations at fairly frequent intervals. One of the most interesting and one might say unexpected features is the absence of recontraction and continuous dilatation is unnecessary. This has been a point which has been emphasized by all writers who have practiced excision.

An analysis of the results of this operation in twenty cases of stricture is presented in tables 1, 2 and 3.

TABLE 1.

ANALYSIS OF 20 CASES OF STRICTURE TREATED BY PARTIAL URETHRECTOMY AND URETHROPLASTY

| | |
|---|---|
| *Type* | |
| Gonorrheal | 11 |
| Traumatic | 7 |
| Congenital | 2 |
| *Location* | |
| Bulbomembranous urethra | 9 |
| Bulbous urethra only | 6 |
| Posterior urethra only | 5 |
| *Complications (preoperative)* | |
| Perineal fistula | 6 |
| Urethral calculus | 2 |
| False passage | 5 |
| Severe infections | 8 |

TABLE 2.

POSTOPERATIVE COURSE FOLLOWING URETHROPLASTY (20 CASES)

| | |
|---|---|
| 1. Urethral catheter drainage | 20 |
| (a) Duration in days: | |
| Shortest 2, longest 9, average 5. | |
| 2. Primary union | 5 |
| 3. Perineal leakage | 15 |
| Duration in days: | |
| Shortest 2, longest 21, average 7. | |

TABLE 3.

POSTOPERATIVE DILATATIONS

| | |
|---|---|
| Average number of days until first dilatation | 10 |
| Minimum number of postoperative dilatations | 3 |
| Maximum number of postoperative dilatations | 9 |
| Time from last postoperative dilatation until next calibration: | |
| Shortest period 3 months, longest period 5 years, average 16 months. | |
| Results of calibration: | |
| No loss of urethral caliber | 11 |
| Loss | 3 |
| Not examined | 6 |
| Of those in whom there was a loss in caliber: | |
| One after 2 years accepted No. 30 F.; previously accepted 34 F. | |
| One after 2 years accepted No. 25 F.; previously accepted 30 F. | |
| One after 8 months accepted No. 25 F.; previously accepted 28 F. | |

The following are abstracts of a few typical case histories.

Case 1. Traumatic stricture of the posterior urethra.

Mr. A. W. B., state industrial case, aged 24, was injured June 27, 1925, and sustained a fractured pelvis and ruptured posterior urethra. No attempt was made to repair the urethra. The bladder was drained suprapubically for thirty days. Attempts at dilatation resulted in severe reactions, local and general with complete retention of urine.

He was referred for examination December 14, 1925. Urination was difficult. The stream was getting smaller with terminal dribbling and incontinence. A distorted, scarred posterior urethra, passable only by filiforms was found.

*Treatment.* Operation, January 5, 1927. Partial urethrectomy. The prostate was exposed without a guide and the urethra opened at apex of prostate. The scar and a portion of the urethra were excised from the prostate to the bulb. The canal was reconstructed about a retention catheter.

*Dilatations.* A No. 26 F. sound the fourteenth day. A No. 30 F. the nineteenth day. There were five subsequent dilatations at frequent intervals.

*Results.* Nine months later (February, 1928) there was no dysuria. The urine was normal. The urethra accepted a No. 30 F. sound with no difficulty. Five months later the findings were the same. Reexamination in June, 1929, showed no recontraction and a No. 30 F. sound could be passed easily.

Case 2. Traumatic stricture of membranous urethra, complicated by perineal fistulae.

Mr. M. J. K., state industrial case, aged 40, was injured September, 1924, by a fall astride the side of an open freight car. The urethra was ruptured and an attempt made to repair it through the perineum. Attempts to pass sounds postoperatively were unsuccessful and were followed by bilateral epididymitis.

Referred for examination September, 1925. There was a dense stricture of the bulbomembranous urethra, passable only by filiforms. There was a severe infection of the lower genitourinary tract, a bilateral epididymitis and several perineal fistulae.

*Operation.* October, 1925. The prostate was exposed through the perineum and the fistulae, scarred perineum and large portion of the urethra excised. The urethra was repaired about a catheter.

*Dilatations.* A No. 25 F. sound on the fourteenth day, then seven dilatations at frequent intervals up to 30 F.

*Results.* Examination on December, 1927, two years after operation, showed a normal urine except for a few pus cells, no dysuria and a No. 30 F. sound could be passed with no difficulty.

Case 3. Congenital valvular obstruction of posterior urethra.

J. W., male, age 30, had suffered from urinary difficulty since childhood. In 1924 an attempt to forcibly dilate the urethra under a general anesthesia resulted in an acute, complete retention of urine, requiring an indwelling catheter for its relief. He was made worse by the procedure.

Examination December, 1925, showed a congenital valve at the membranoprostatic junction (type 3, Young's classification) with marked sacculation of the posterior urethra, almost a diverticulum behind the valve.

*Operation.* February 6, 1925. Prostate was exposed as in a perineal prostatectomy. The posterior urethra was opened and the valve and redundant, sacculated posterior urethra excised. The urethra and soft parts were sutured about a retention catheter which was removed after seven days.

*Dilatations.* Six up to 30 F. at short intervals.

*Results.* There was no urethral calibration until two years later, at which time he accepted a No. 25 F. sound with no difficulty. A No. 30 F. was passed at the second dilatation. The urine was normal and there was no dysuria.

Case 4. Gonorrheal stricture of bulbomembranous urethra.

C. K., quartermaster, first class, U.S.N., aged 22, had had gonorrhea fifteen years previously. There had been numerous recurrences, and repeated dilatations for stricture were followed by severe reactions, local and general, and a rapid recontraction of the stricture.

The patient was admitted to the hospital with chronic, incomplete retention of urine. Filiforms were passed with difficulty. Because of the previous history a urethroplasty was suggested and accepted.

*Operation.* July, 1921. A urethroplasty was done with excision of stricture after the method of Maxmillian Stern.

*Dilatations.* Four postoperative up to 30 F.

*Results.* Patient returned to duty. There were no urethral calibrations until five years later. Patient did not know size of sound used. Seven years after the operation he accepted a No. 27 F. sound with no difficulty, although there had been only one dilatation since the operation.

# SOLITARY CYST OF THE KIDNEY*

O. F. Lamson, M.D.
SEATTLE, WASH.

Solitary cysts of the kidney are quite rare and the one I am reporting is of such enormous size that it seems worthwhile to bring this subject to your attention. Young states in his practice of urology that out of 12,500 cases reported at the Brady Institute of Urology, there was not a single one of solitary cyst of the kidney.

Some pathologists claim these cysts are not as rare as usually supposed, and cite autopsy findings in which they are found in from 3 to 5 per cent. Most of these are small, serous retention cysts of no clinical significance. Some of these contain straw colored fluid, while others contain blood, usually old and necrotic unless there has been a recent hemorrhage.

It is quite likely that in most cases the hemorrhage is secondary and occurs from ruptured vessels in the wall of the enormously distended cyst. Colston reports a case in which there was a solitary cyst and a coexisting papillary cyst adenoma of the kidney. The question might naturally arise which process was primary and if the adenoma by blocking the tubules might have caused the cyst to develop. On the other hand, the cyst may have been primary and have been an important factor in the development of the papillary cyst adenoma, through the well known theory of chronic irritation which is recognized as an important cause in the development of cancer elsewhere.

The etiology of solitary cysts is more or less theoretical. The lesion has not been produced that I am aware of by animal experimentation to verify the theories that have been advanced. Three etiologic factors have been suggested as causes for the development of solitary cysts. (1) They are due to embryologic defects. (2) They are caused by a failure of union between the glomeruli and connecting tubules. (3) They are retention cysts due to constriction of the tubules, most probably by inflammatory processes or congenital defects.

That they are retention cysts is more generally accepted, but it is quite possible that there may in addition be some congenital defect. The cyst arises from the cortical portion of the kidney. As it develops it approaches the surface of the kidney and thereby thins the cortex which with the capsule forms the cyst wall. The cyst rarely, if ever, communicates with the kidney pelvis.

There is a great variation in the size of the cysts, ranging from that of an English walnut to one that is large enough to almost fill the abdomen. It is only the larger ones that we are concerned with clinically, as the small cysts do not cause symptoms and are usually not found except in postmortem examinations or in the palpation of the kidney in the course of an abdominal operation.

The diagnosis of solitary cyst of the kidney is rather difficult from examination as it might easily be confused with any other tumor of the kidney. The history of a tumor developing in the kidney region after middle life, with a gradual increase in size without any special symptoms, would lead one to suspect a cyst. If it is very tense one may not be able to elicit fluctuation. By cystoscopic examination and pyelography one can differentiate between a cyst and hydronephrosis.

Braasch and Carmen pointed out several years ago that in large cysts of the kidney there is a shortening of the adjacent calices and flattening of the nearest portion of the pelvis. It is possible, however, to have a normal pyelogram with a cyst, if it is so situated as not to deform the calices and pelvis. In a very large cyst, however, this is hardly possible as there is sure to be some pressure on the calices and pelvis of the kidney. The pyelogram of a hydronephrotic kidney will naturally show an enormously distended pelvis.

The renal function is likely to be very much impaired in a large solitary cyst, due to excessive pressure on the kidney. Most of the 250-odd cases reported have occurred in patients between thirty and sixty years of age, although they have been reported in infants and children.

The growth is usually slow and no definite symptoms are noted. Usually these cysts are discovered in a routine clinical examination. Occasionally the patient discovers the tumor. Some remain stationary for years, while others have a tendency to grow rapidly until they fill almost the entire abdo-

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* Read before a Meeting of Western Surgical Association, Del Monte, Calif., Dec. 12-13, 1929.

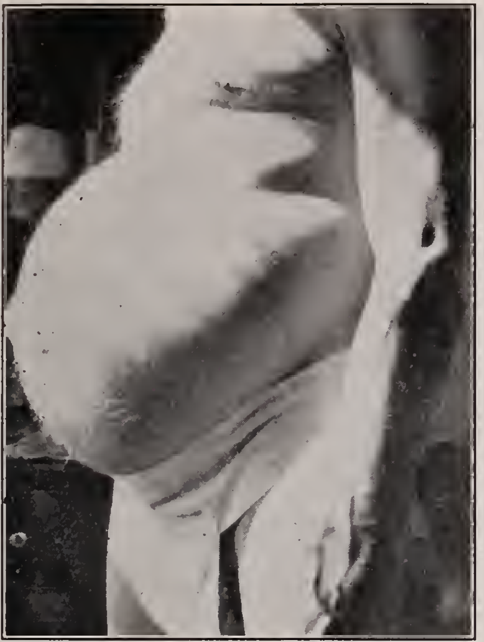

Fig. 1. Side view of abdomen, showing size of tumor.

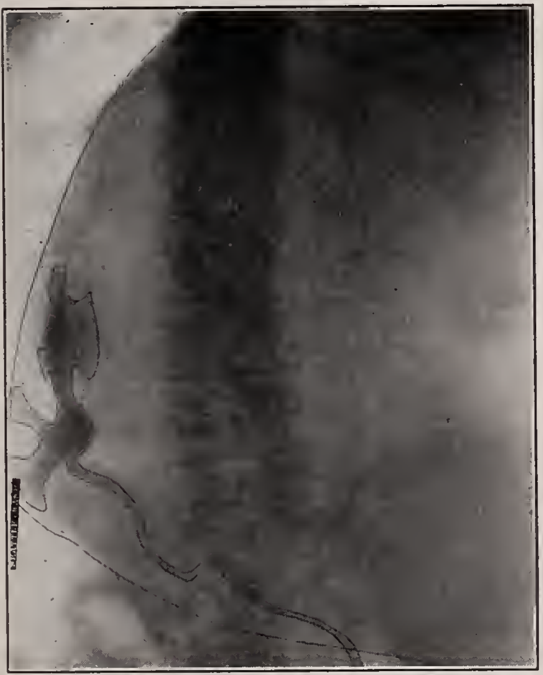

Fig. 2. Pyelogram of right kidney, showing displacement to left of midline.

men. Hemorrhage into the cyst in some cases undoubtedly accounts for its rapid enlargement.

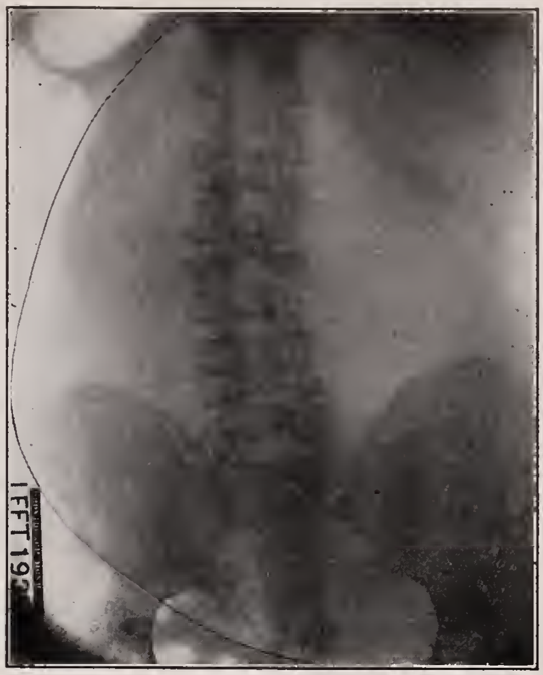

Fig. 3. Shows tumor filling right side of abdomen and extending six inches to left of midline.

Of the cases reported, about two-thirds have been in women, one-third in men. The treatment is surgical. In some cases, if the cyst is not too large, it may be removed together with a small part of adjacent renal tissue or it may even be wise, if it is confined to one pole, to resect the pole of the kidney with the cyst. In the very large cyst nephrectomy is nearly always indicated.

The following is a report of a case of solitary cyst which, on account of its enormous size and comparative absence of symptoms, seems of sufficient importance to place on record. The patient was a man, age 66, first examined July 26, 1929. He gave a history of the gradual development of a tumor in the region of the right kidney of about fifteen years duration.

The tumor had gradually enlarged until it almost filled the entire abdomen, pushing the stomach, colon and small bowel well over to the left. There had been no associated pain. He complained a little of distress in the right inguinal region when he stooped over and some shortness of breath, probably due to pressure on the diaphragm.

Examination of the patient revealed a tumor which nearly filled the abdomen (fig. 1). In the left lower quadrant could be felt a mass about one-half the size of a normal kidney, evidently a part of the tumor. No fluctuation was elicited As the patient gave a history of gradual development of a tumor which was first noted in the right kidney region, I was quite sure it had originated in the right kidney.

Urinalysis showed a trace of albumin and an occasional cast; normal specific gravity. Dr. O. A. Nelson made a renal study, experiencing considerable difficulty as the patient had a large prostate.

The renal study showed a normally functioning left kidney but no function was shown in the right kidney in forty-five minutes. A pyelogram of the left kidney was normal. The left ureter was displaced to the left considerably by the tumor.

A pyelogram of the right kidney showed the pelvis displaced to the left of the midline about four inches (fig. 2). There was a marked flattening and elongation of the calices which was considered characteristic of cysts of the kidney. The roentgenogram also showed an abdominal

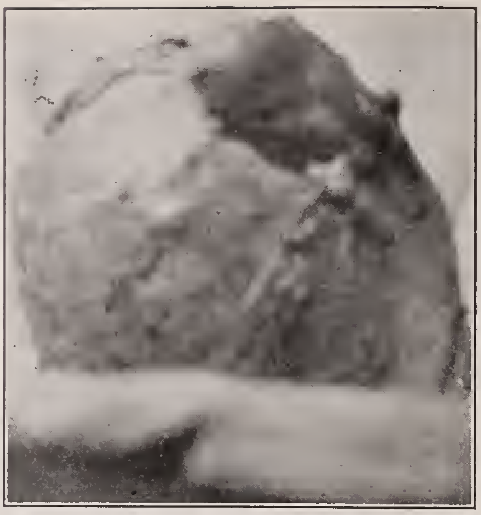

Fig. 4. Photograph of cyst, showing remnant of kidney on upper border.

tumor filling the right side of the abdomen and extending fully six inches to the left of the midline (fig. 3). Dr. Nelson made a definite diagnosis of a solitary cyst of the right kidney and recommended operation.

Operation was performed July 30. A right rectus incision was made, extending from the right costal margin to the level of the pubes, and an incision at right angles to this, extending to the right hypochondrium. In attempting to deliver the tumor it ruptured and a large amount of the contents escaped. The cyst contained about eleven or twelve quarts of a dark brownish fluid. It was dissected from its attachments and removed with the remaining portion of the kidney. The wound was closed and drained. It healed by first intention and the patient made a satisfactory recovery.

### PATHOLOGY

*Gross examination.* Large, roughly rounded mass, 30 cm. in diameter, consisting almost entirely of a huge cyst, on which about one-half of kidney is seen projecting (fig. 4). The cyst is rough on outer surface from adhesions. The walls average 4 mm. in thickness. Cyst is filled with brownish fluid and detritus, some of the latter being adherent to the inner surface, but easily scraped off, leaving a white reticulated surface. The cyst is separated from the kidney proper by this thick wall. In addition to the main cyst several small urinary cysts appear in the kidney remnant.

*Microscopic findings.* Section of the cyst wall shows only structureless degenerated material on the inner surface. The wall proper is essentially fibrous, with a few infiltrating lymphocytes.

*Diagnosis.* Degenerating cyst of kidney.

The outstanding features of this case may be summarized as follows:

1. The enormous growth of the tumor had been a gradual one for a period of over fifteen years, with displacement of the stomach, colon and small intestines to the left side of the abdomen.

2. In spite of the great size of the tumor, there was a comparative absence of symptoms. The symptoms complained of were moderate dyspnea, due to pressure on the diaphragm and thereby some limitation of expansion of the lungs; enlargement of the abdomen and some distress in the right groin on attempting to stoop over. He was moderately constipated which could probably be attributed to the tumor.

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## COLLOID CARCINOMA OF THE URINARY BLADDER*

Alexander Hamilton Peacock, M.D.
AND
Donald G. Corbett, M.D.
SEATTLE, WASH.

Ninety per cent of all tumors of the urinary bladder arise from epithelial tissue and practically all of them eventually become malignant. The various terms and classifications of these tumors are confusing. They should really be classed as carcinoma, then designating the types as squamous-cell, nonsquamous (basal-cell), malignant, papilloma, papillary carcinoma, and adenocarcinoma. In addition there are the various early nonmalignant growths, as adenoma, cyst, hemangioma, benign papilloma, fibroma, lipoma, leiomyoma and dermoid cyst. Last there are the rare embryomata which may be benign or malignant, as teratoma, myxoma, rhabdomyoma, chondroma and dermoid cyst. Colloid carcinoma is included under the adenocarcinoma class. Adenocarcinoma is rare, forming one-half per cent of all bladder tumors. It seldom invades the bladder wall.

The ideal treatment of all bladder tumors, aside from the frank papillomata, is resection of the growth. Radium, deep roentgen rays, coagulation and diathermy are poor substitutes for the knife. At best, a partial destruction of the growth is effected. Results are looked for in the secondary slough and cicatrization. With the knife, either cold or radio, the tumorous area is entirely removed, the incision being made into healthy tissue.

Where the tumor involves a ureteral orifice, the ureter should be severed and reimplanted in the reconstructed bladder or into the sigmoid. It is surprising how large a portion of the bladder can be resected and yet leave a good functional organ. Complete resection of the tumor gives the patient the best chances for a cure. This same principle holds good for carcinoma of the breast, the lip, the cervix and other tissues.

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* Read before Annual Clinic of Seattle Surgical Society, Seattle, Wash., Jan. 18, 1930.

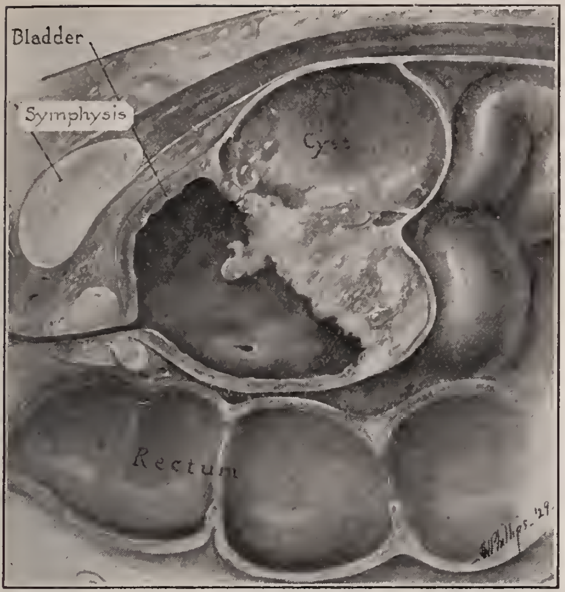

Fig. 1. Shows carcinoma of bladder with collection of cysts.

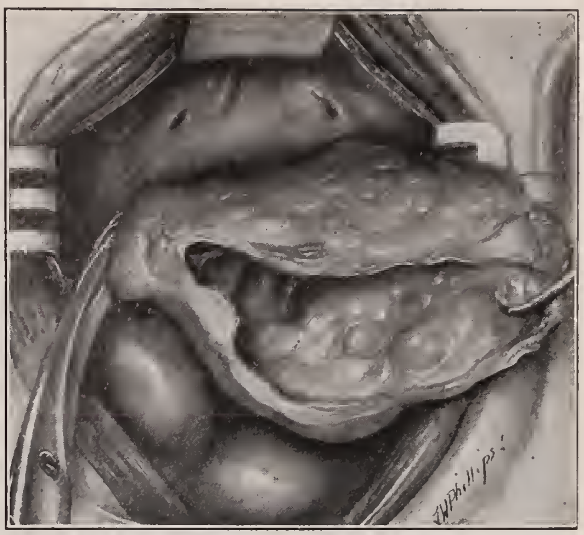

Fig. 2. Shows resection of the neoplasm.

In bladder surgery there is no objection to entering the peritoneal cavity, packing off the bowels when necessary and cutting through all coats of the bladder. The danger of infecting the peritoneal cavity with urine is extremely remote in my experience. A complete excision of the carcinoma seems to offer the patient the only hope of a cure. All other methods of destruction so far have been most inefficient and unsatisfactory.

The following case is reported as of unusual interest. The cystic formation, full of sago-like material, and the large size of growth are seldom encountered. Referred by Dr. J. A. Benshoof.

Patient, a white male, 68 years old, married and a grocer by occupation.

His family, past medical and surgical histories are negative.

Five months before presenting himself for examination, he noted that he urinated too frequently. Nocturia four or five times. No pain. His stream was fair, started and stopped easily. This continued for four months, when he voided a considerable amount of bloody urine. Hematuria has continued at intervals, generally terminal. No symptoms referable to the upper urinary tract.

Physical examination was negative. His prostate was normal. There was no residual urine. His urine was cloudy, showed many red blood cells and pus cells, no tubercle bacilli or other bacteria. His Wassermann was negative.

Cystoscopy showed a granular posterior urethra, an irritable, trabeculated bladder with a marked hypertrophy of the interureteral ridge. No tumor, ulcer or foreign body was seen. The ureters were catheterized. Pyelograms were negative. A diagnosis of posterior urethritis was made.

He was placed on palliative treatment and improved immediately. This continued for several months, at the end of which time, though not uncomfortable, he still voided considerable blood and large chunks of tissue. Exploratory cystotomy was recommended and performed under spinal anesthesia.

A transverse incision was made two inches above symphysis through the skin and fascia. Recti muscles were separated and a ball-like mass, apparently bladder, was easily seen (fig. 1). On incision, however, it was found to contain about 300 c.c. of ropy, colloid material. When this was removed, the mass was seen to be a cyst on top of the bladder. The bladder was then opened, and the tumor mass was found to project very slightly into the bladder on the posterior wall over an area of about 10x7 cm. The remainder of the bladder was normal. The peritoneum was opened and entire tumor exposed. It was found to be limited entirely to the bladder. The tumor was entirely resected, the peritoneum and bladder closed, a large drainage tube being tied in place (fig. 2).

The patient's condition at the end of the operation was satisfactory. The drainage tube was removed in six days and patient started to void the next day. In four weeks time the wound was entirely tight, and no symptoms have persisted or recurred since operation.

*Pathologic report.* Large cystic spaces lie between strands of fibrous tissue, and occasional smooth muscle. Lining the cysts are occasional patches of epithelium of columnar type, and usually in a single layer. No squamous celled areas are seen.

*Diagnosis.* Colloid carcinoma of bladder.

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REPORT OF PROGRESS ON USE OF EPHEDRINE IN CASE OF MYASTHENIA GRAVIS. Harriett Edgeworth, Tucson, Ariz. (*Journal A.M.A.*, April 12, 1930), relates her own experiences as the subject of therapeutic experiments made to give relief from the symptoms of myasthenia gravis. Quite by accident she discovered that relief followed the taking of ephedrine. In the past three months she has been taking six-eighth grain daily except for a few days. She is now able to walk the distance of several rooms, to get into and out of a car with a small amount of help, and to speak and chew without difficulty. She can raise her arms to her head for a few minutes, write a short letter, and read the morning newspaper without diplopia appearing. The pulse quality has improved, and she is much less conscious of a shortness of breath. The cyanotic symptoms have almost disappeared.

# DIAGNOSIS OF ARTHRITIS

R. L. Jeffery, M.D.
SEATTLE, WASH.

In this short paper it is obviously impossible to discuss arthritis exhaustively but I will try to analyze a typical case of infectious arthritis. This type is seen frequently by every general practitioner and, although apparently very simple, often leads to a great deal of mental anguish in the minds of both patient and doctor because of the frequent failure of the condition to respond to ordinary measures.

I have selected this particular case because it so well illustrates what may be called the masked focus of infection which constitutes the etiology. Let us first consider the history and physical findings.

The patient is a woman, age 40, housewife by occupation. She has two children both living and well. She has had no serious illness except influenza in 1918 and again in a milder form in 1927. Convalescence following the last attack was rather slow, but after two months she seemed quite normal and thinks she has been quite well ever since, although she tires easily. She has noticed since then that she has had rather frequent colds which is unusual for her. Menstrual history is negative. There has been a slight tendency toward constipation since 1918, but she has always been very careful to secure at least one good bowel movement daily.

Present complaint. Eighteen months ago she noticed a slight swelling of the second joint of her ring finger which was painful but lasted only ten days. Some time later, however, the swelling again appeared with the addition of two other swollen joints on the other hand and a few days later her left knee became involved. On the advice of her physician the tonsils were removed with no beneficial effect.

Roentgenograms showed two devitalized teeth, one of which had a small apical abscess. These teeth were removed and the following day her symptoms were greatly exaggerated and she was forced to go to bed for a week. The process did not subside entirely but was somewhat improved during the following three months. Then her other knee became involved. She then tried mud baths, chiropractic treatments, various diets, etc. The course of the disease was up and down and she began to have stiffness and pain in both shoulders.

Physical examination. This is distinctly disappointing because there is absolutely nothing that we can point to which is abnormal except a slight lowering of the polymorphonuclear leucocyte count, a moderate anemia and low hemoglobin. In our search for focal infection we find sinuses clear. Tonsils have been cleanly removed, nasal passages clear, and there is a slight redness of the pharyngeal wall. Roentgenograms of the teeth are negative. There is a slight degree of pyorrhea present. The chest cavity is entirely negative. The abdomen shows nothing but a slight tenderness over the ascending colon and some evidence of gas in the cecum. The blood pressure is slightly subnormal for a woman of her age.

It is quite obvious to us that we are dealing with a straight case of infectious arthritis. But where is the infection located and what is the exact state of affairs surrounding such a case?

Let us review the events leading up to the tragedy, as the detectives say. In the first place, note the fact that she has had no illnesses except influenza and these occurred in 1918 and 1927. Also, observe that she did not do well following the second attack. Further, if we question her carefully concerning her subsequent health, she admits she has not been quite as active as usual and tires more easily than prior to 1927, but she had considered her health good. Note that her constipation dates back to 1918, following the influenza attack of that year.

The next fact of interest is that she had her tonsils removed without improvement and removal of the teeth set up an acute exacerbation of her arthritis.

With these facts in mind we can feel reasonably justified in drawing conclusions as to the origin, course and present location of her infection. We know that influenza is fundamentally a streptococcal infection. If the patient develops sufficient resistance at the time of the infection, no sequellae result. But if the immunization process is not complete, the streptococci may remain in the body for years as saprophytes. The patient while in reasonably good health will maintain a sufficient immunity to render these organisms relatively harmless.

Concerning this patient it is very probable she did not recover from the first influenzal infection but retained a residual focus in her colon. Hence her constipation tendency. She must have fared even worse from her second attack in 1927 for we see ample evidence of the effects of chronic infection ever since, viz., slow recovery, lack of usual pep, easy tiring and diminished resistance to colds, etc. A rather significant observation is the fact that chronic infection seems to have a fairly definite effect on the red cell count and the hemoglobin in patients of this type. We almost always find there is a very definite anemia and also a definite lowering of the hemoglobin content of the blood.

The tonsillar infection, while always a menace and a possible focus, probably had very little to do with the arthritis. The teeth, however, must have had a very definite relationship to her arthritis and were undoubtedly definite foci. It must be remembered that this woman's body was making desperate efforts to widthstand the barage of organisms and toxins thrown into the blood stream from her other foci at the time the teeth were extracted. The trauma and tissue laceration attendant upon the extraction threw another shower of arthritic organisms into the already overtaxed blood stream and an acute progression of the disease resulted for a time.

The very important point which I wish to make is that chronic infectious arthritis, is not usually caused by a single focus of infection but is the result of multiple foci which as a rule include the gastrointestinal tract. I have tried to give our ideas as to how the original infection gains entrance and later a foothold in the body. It is our opinion that only certain strains of streptococci cause arthritis and that these vary in different people and in different localities.

Aside from the special problem of treatment, what interests us at this time is the factor or factors which tear down the individual's resistance to the point where the infection causes acute joint symptoms to develop. We have found several factors which seem to us important. First and most important is worry. If you will delve into your case histories in this regard you will be surprised to find how many cases of arthritis are preceded by worry on account of financial, domestic troubles or grief. Another factor is associated disease, such as cancer, diabetes, amebiasis, endocrine disturbances, etc. Other conditions which some times have a bearing are overindulgence of various sorts.

Putting arthritis on a chronic infection basis makes the treatment naturally a problem in immunology. We have treated a great many cases in the last few years by various methods, ranging from straight orthopedics to intravenous medication. We have found that the serologic methods of Burbank and Hadjapoulis give us by far the best and most satisfying results. Burbank's methods are too involved in detail to discuss here but we hope in a subsequent paper to present the results which we have met with in its use.

1213 Medical and Dental Bldg.

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# SHORT HEEL CORDS

H. J. Wyckoff, M.D.
SEATTLE, WASH.

This was the term used during the late war to designate a condition in which the foot could not be dorsiflexed to the normal 15° to 20°, on account of an actual shortening of the tendo achilles and a spasmodic condition of the calf muscles. In the routine examination of men for military service it was found that in at least 16 per cent the foot could not be brought above a right angle with the leg without considerable difficulty. Most of these men presented no findings other than the shortening. In office practice this condition is found very frequently, producing a variety of symptoms. Many more cases are seen in women than men.

The cause is not definitely known, but it is believed that an actual shortening of mild degree may be present at birth. This may be aggravated by various conditions, such as occupation, prolonged confinement to bed without support to the feet, improper shoes or frequent changing of shoes with varying heights of heels. The most frequent age for symptoms to develop is between thirty and forty, but cases have been seen as young as two years and as old as eighty.

With a shortening of the heel cords the weight of the body is thrown forward and, when balance is reestablished, there is a resulting strain on the muscles and ligaments about the lower back, hips and knees. This shortening frequently produces a disturbance of the normal muscle balance of the anterior and posterior muscle groups of the leg. The anterior muscles are stretched and become weakened and easily fatigued. The posterior muscles are under more or less continuous strain, the patients at times complaining of aching or cramps in these muscles. There is frequently a thickening about the tendo achilles with tenderness on pressure. A bursitis may develop at the point of attachment of the tendon to the os calcis, the so-called "Albert's disease." This usually develops only when a shoe or boot causes direct pressure at this point.

A shortening of the heel cord causes a lateral instability below the ankle, allowing or forcing the foot to roll inward or outward. If the foot rolls inward, a sprain of the external lateral ligaments may result. If it rolls outward, a strain on the longitudinal arch may occur. A pronated foot, which would normally produce no symptoms, is subjected to an added burden by a shortening of the heel cords and symptoms develop.

Normally, when standing, at least two-thirds of the weight of the body is carried on the heel. With a shortening of the heel cord the heel is practically suspended and an abnormal amount of weight is thrown on the anterior part of the foot. The metatarsal arch is not designed to carry much weight, so when added weight is thrown upon it, the arch flattens or is actually reversed. This portion of the foot widens so that, even with shoes of extreme combination last, pressure cannot be avoided over the first and fifth metatarsal heads. Continued pressure over the first metatarsal head produces a bursitis and a bony enlargement which in time forms the typical bunion.

A loss of the metatarsal arch produces other symptoms, such as metatarsalgia, Morton's toe, calluses under the metatarsal heads, clawing of the toes and corns. It may be safely said that most foot conditions may be caused directly or indirectly by short heel cords.

The treatment depends on the degree of shortening. The milder cases may be relieved by daily stretching and exercises. Most of the cases with symptoms fall in the class of moderate shortening. These can usually be corrected by stretching in casts. The casts are applied with the knee flexed and the foot in a corrected position. At the end of five days the casts are wedged and the final correction made. The casts are removed in from ten days to two weeks and walking allowed in strong, well fitting shoes. Daily exercises are advised for at least six months. As a rule the foot conditions require no other treatment. The cases with extreme shortening require tenotomies, but these are very rare.

In summarizing the following points may be made:

1. Short heel cords are very common.
2. All short heel cords do not produce symptoms.
3. Improper shoes are an important factor in producing this shortening.
4. Almost all foot conditions are a result of short heel cords.
5. Most cases can be easily relieved by stretching in casts.

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**Metaphen as Germicide and Skin Disinfectant.** George W. Raiziss, Marie Severac and J. C. Moetsch, Philadelphia (*Journal A.M.A.*, April 19, 1930), report on the results of an extensive study of metaphen and many other antiseptics in blood serum and skin disinfection. The technic used to study the skin disinfection is in principle the same as that of Roberts, with certain modifications. They contend that only an antiseptic which passes the most rigid test is to be considered safe for use in all clinical cases in which a germicide is to be applied. The conclude, therefore, that, considered from this point of view, ethyl alcohol, which is used extensively, is disqualified as a skin disinfectant. A solution of hexylresorcinol 1:1,000 (S. T. 37) gave growths of bacteria in all tests. Acriflavine base was found to be efficient in the 2 per cent concentration, resulting in sterilization in 80 per cent of cases. It is important to note that a 5 per cent solution of iodine is ineffective and a 7 per cent is effective in 88 per cent of cases. Two per cent mercurochrome-alcohol-acetone-water solution showed only 79 per cent efficiency. An aqueous solution of metaphen 1:2,500, or 0.04, produced sterilization in all of the fifty tests performed. Metaphen proved to be efficient in very high dilutions. This a 1:2,500 dilution of it, or 0.04 per cent, was found to produce 100 per cent sterilization, while 7 per cent iodine and 2 per cent mercurochrome sterilized at five minute intervals to the extent of 70 per cent and 50 per cent, respectively. This indicates that better results were obtained with metaphen in dilutions 175 and fifty times greater than those employed for iodine and mercurochrome, respectively.

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# STABILIZATION OF THE PARALYTIC FOOT*

C. F. Eikenbary, M.D.,
and
John F. LeCocq, M.D.
SEATTLE, WASH.

The characteristic element in practically all paralytic feet is instability. This may be the result of extensive paralysis, resulting in the flail foot or a paralysis of only one or two muscles, resulting naturally in deformity. The child who has a weak tibialis anticus and a weak common extensor will naturally develop an equinovalgus deformity, the reasons being purely mechanical; the result is a marked degree of instability. Other deformities result from paralysis of other muscles or other groups of muscles, the cause in all cases being purely mechanical and readily understood.

While it may not be within the province of this paper, we wish to again emphasize the well known fact that paralysis and deformity should not be synonymous terms. While a partial paralysis of the extrinsic muscles of the foot is the cause of deformity, this need not and would not occur, if the foot were properly supported during and following the period of recovery. The orthopedist should not be required to operate for the correction of a preventable deformity. If the patient came to the orthopedist with paralysis only, it would be a far easier task to evaluate the existing condition, the degree of paralysis, etc.

Too much emphasis cannot be placed upon the necessity of early and constant support for all cases of infantile paralysis. Recovery is markedly aided by proper support and deformity is prevented.

Twenty-five years ago great emphasis was laid on tenotomy, this being done, of course, to correct deformity. Transplantation of tendons was just in its infancy. Tenotomy of the tendo achilles for the correction of equinus was more frequent than that of any other tendon. The tenotomy certainly had no effect toward increasing the stability of the foot. On the contrary, it all too frequently converted a moderately stable into an unstable foot; thus a brace became necessary. Walking with a brace probably was an improvement over the former condition of deformity, but was far from satisfactory.

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* Read before a meeting of North Pacific Surgical Association, Portland, Ore., Dec. 6, 1929.

Tendon transplantation, the use of artificial ligaments of silk and tendon fixation to take the place of ligaments, all had their vogue about the same time. The use of braided silk to take the place of paralyzed tendons by acting as artificial ligaments was doomed to failure from the start; it was an unphysiologic procedure, utterly inadequate for the task imposed upon it, and has fallen into disuse. The effort was interesting but mechanically unsound. Fixation of paralyzed tendons into bones was a step in advance of the use of silk, more valuable than the silk but mechanically unequal to the strain. In children the use of tendon fixation occasionally resulted in serious deformation where none existed before. The foot would grow, while the fixed tendon would remain fixed, thus pulling the foot into the attitude of deformity. This procedure has practically passed into disuse. We see no reason for its retention in modern surgery.

Tendon transplantation has survived and still has its use. Its use, however, is very limited. It is practically impossible to accurately evaluate the strength of the tendon to be transplanted. It may be too strong or too weak; in either case the result is likely to be disappointing. Too often we have seen the attempt made to transplant a plantar flexor tendon to a position where its action to be of value must be that of a dorsal extensor. Such attempts are not based upon sound physiology and result in failure. A strong hallucis longus tendon may be made to partially take the place of a weakened tibialis anticus, or a weakened common extensor may be strengthened by the transplantation of a fairly strong tibialis anticus to the center of the tarsus. The results are fair but by no means brilliant.

There is one condition wherein tendon transplantation works remarkably well, in a paralytic calcaneous where we have a good tibialis posticus and a good peroneus longus. Excellent results may be obtained by the transplantation of both tendons through a hole bored through the os calcis, thus taking the place of a weakened tendo achilles. It has been my experience that this represents the one really excellent procedure for tendon transplantation.

For the past fifteen years we have heard more and more of stabilization by means of work on the bony structures by arthrodesis. Today we feel that arthrodesis of one type or another represents the only efficient and certain means of properly stabilizing the paralytic foot. For years we have practiced arthrodesis and we are not in any way disappointed with the results. The procedure corrects the deformity and the bony ankylosis prevents its recurrence.

Paralytic equinovarus and equinovalgus both represent deformation in the midtarsal joint, a shortened tendo achilles and a lack of stability in both the midtarsal region and the subastragalar joint. A midtarsal arthrodesis to correct the lateral deformation is necessary.

Thorough denudation of the articular surfaces of the astragaloscaphoid and the calcaneocuboid joints is performed. The portion of bone removed is somewhat wedge shaped, the base of the wedge being on the inner or outer side, depending on whether the deformity to be corrected is that of valgus or varus. Following the midtarsal procedure, the same plan is carried out with reference to the subastragalar joint. A thorough denudation of this joint is not so readily accomplished as in the case of the midtarsal joint, but with ordinary care it can be accomplished. The tendo achilles usually has to be lengthened. In order to prevent a recurrence of the equinus, the scaphoid is cocked up on a higher level than it usually occupies (fig. 15, case 5). The operation is accomplished through a linear incision two inches in length, extending forward from a point in front of the lower end of the external malleolus.

The foot and leg are then incased in a plaster dressing which is worn from eight to twelve weeks. Naturally it is exceedingly important that the foot be placed in the plaster bandage in exactly the position that is desired. A midway position is generally desirable, the foot being about 10 degrees below a right angle with the leg (fig. 10, case 4).

Calcaneus deformities are more difficult to deal with, but when properly treated the end-results are quite satisfactory. The same midtarsal and subastragalar arthrodessis as mentioned above are performed. The head of the astragalus, however, must be removed in its entirety. The sustentaculum tali must be completely excised. If enough bone has now been removed, both in the midtarsal and the subastragalar regions, the foot can be displaced backward, thus putting it in a position where the body weight comes nearer the center of the foot (fig. 11, case 6). The anterior lever is decreased in length and at the same time the posterior lever is increased.

Some modification of the above procedures is frequently necessary, but in the main the arthro-

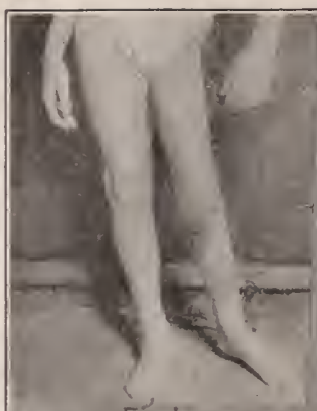

Fig 1

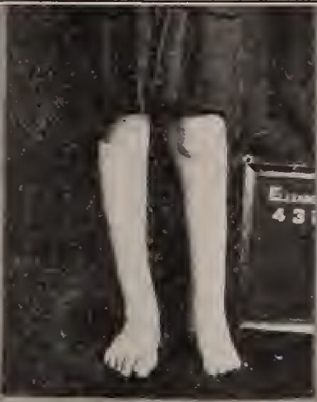

Fig 2

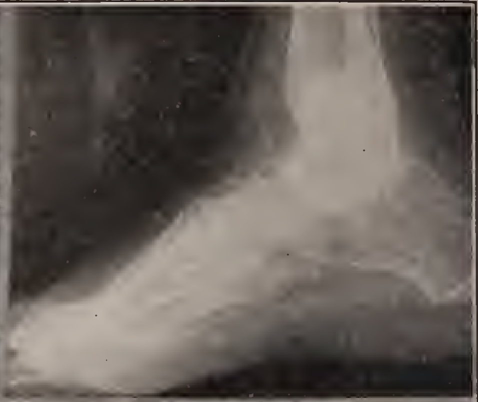

Fig 3

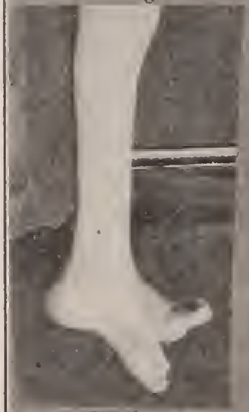

Fig 4

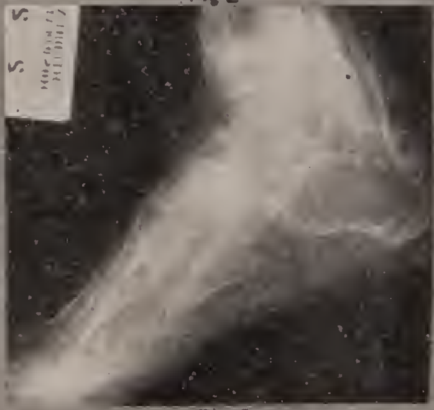

Fig 5

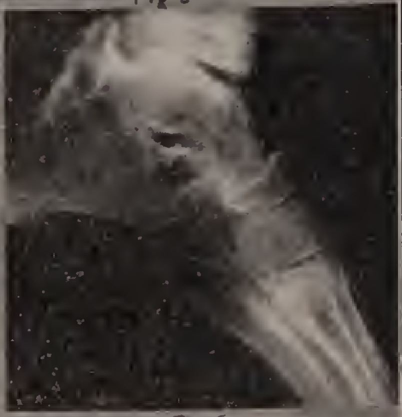

Fig 6

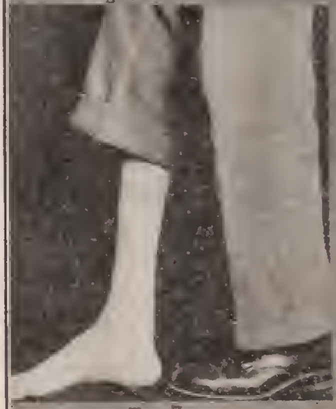

Fig 7

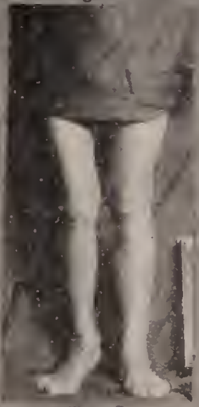

Fig 8

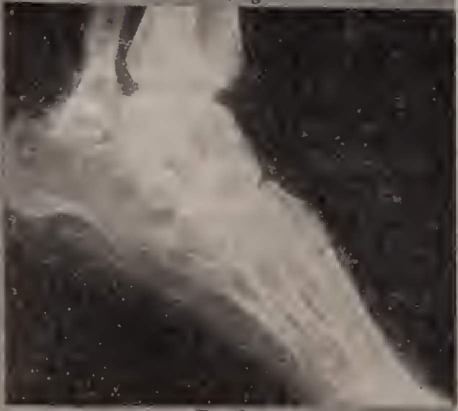

Fig 9

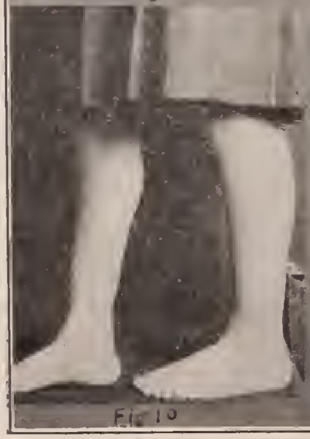

Fig 10

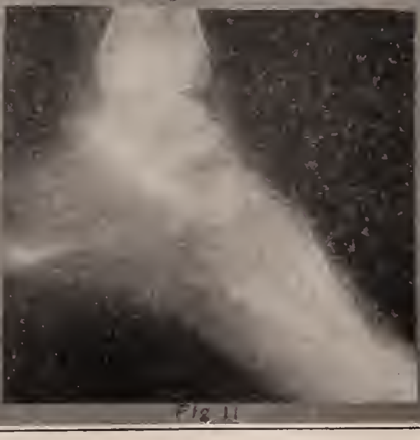

Fig 11

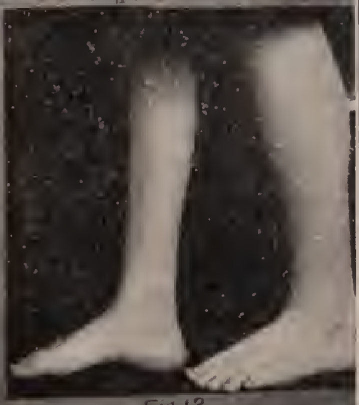

Fig 12

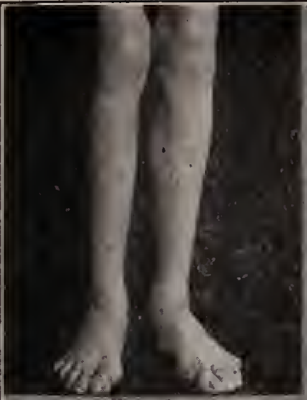

Fig 13

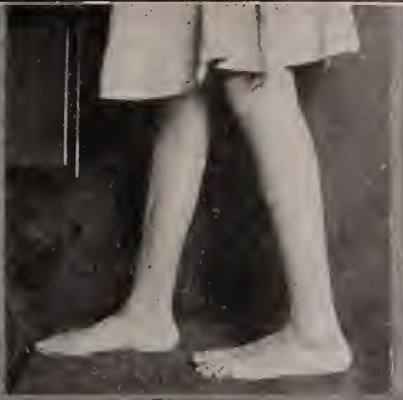

Fig 14

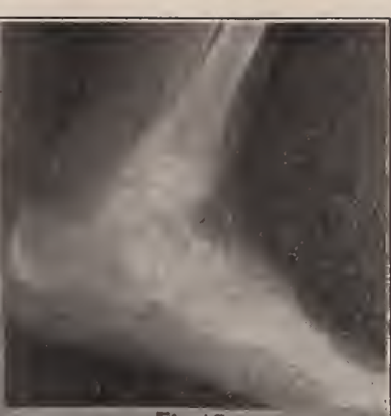

Fig 15

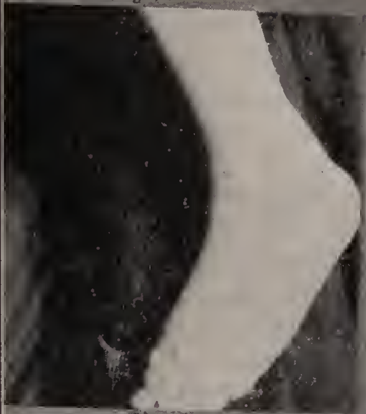

Fig 16

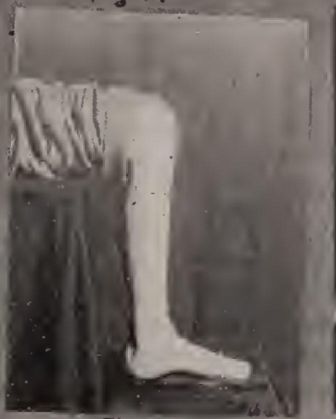

Fig 17

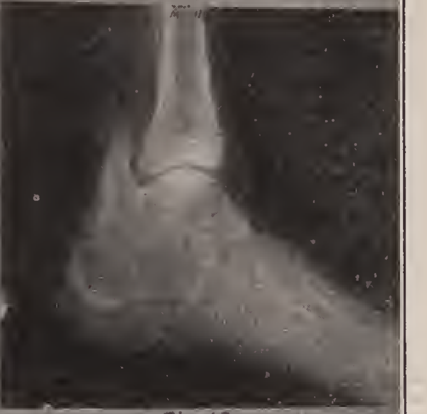

Fig 18

desis described is rather rigidly adhered to. Occasionally we find it desirable, in cases of equinus (combined with either valgus or varus deformity), to build up a bony block on top of the os calcis, just posterior to the tibia (Campbell) (fig. 6, case 3; fig. 18, case 7). The object, of course, is to prevent the foot from dropping into the equinus position, very much as the olecranon prevents hyperextension of the elbow. This block is built up by turinng up masses of bone from the os calcis and by utilizing small pieces removed from the midtarsal region.

The illustrations submitted herewith are explanatory of the various procedures described.

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Fig. 1, Case 1. Paralytic flail foot in equinus. Brace was required.

Fig. 2, Case 1. Position of foot after arthrodesis and tibial block (Campbell). No brace required.

Fig. 3, Case 2. Calcaneocavus. Radiograph following midtarsal and subastragalar arthrodesis, combined with marked posterior displacement of foot. Braces required before operation.

Fig. 4, Case 2. Position of foot and range of movement after operation. Walks well without braces.

Fig. 5, Case 2. Arthrodesis in midtarsal region and also of subastragalar joint. Tibial block built on os calcis posterior to tibia.

Fig. 6, Case 3. Flail foot in equinus before operation. Radiograph after operation showing midtarsal and subastragalar arthrodesis, combined with tibial block on os calcis and posterior to tibia. Braces before operation.

Fig. 7, Case 3. Position of foot following operation. Walks well without braces.

Fig. 8, Case 4. Paralytic equinus before operation. Braces necessary.

Fig. 9, Case 4. Paralytic equinus. Radiographs showing result of midtarsal and subastragalar arthrodesis, combined with tibial block. Block more extensive than necessary.

Fig. 10, Case 4. Walking position of foot after operation. Walks well without brace.

Fig. 11, Case 5. Severe calcaneus. Braces were necessary. Radiographs showing midtarsal and subastragalar arthrodesis combined with marked posterior displacement of foot.

Fig. 12, Case 5. Walking position after operation. Walks remarkably well with braces.

Fig. 13, Case 6. Paralytic flail foot. Before operation. Braces necessary.

Fig. 14, Case 6. Walking position after operation.

Fig. 15, Case 6. Midtarsal and subastragalar arthrodesis. Scaphoid was displaced upward so as to take care of tendency to foot drop. Walks well without braces.

Fig. 16, Case 7. Paralytic flail foot in equinus. Braces necessary.

Fig. 17, Case 7. Position of foot after operation. Walks well without brace.

Fig. 18, Case 7. Radiograph showing midtarsal and subastragalar arthrodesis, combined with posterior tibia block built upon top of os calcis.

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Normal Blood Pressure in Essential Hypertension. The instability of the blood pressure in essential hypertension will often lead to normal readings of the blood pressure if the patient sits quiet for from five to twenty minutes. This occurs even in patients with widespread vascular changes. David Ayman, Boston (*Journal A.M.A.*, April 19, 1930), asserts that 56 per cent of seventy-six unselected, untreated cases exhibited this finding. The paradoxic statement that the disease hypertension may exist with normal blood pressure apears to be justified. There is a wide range of circumstances tending to lower an elevated blood pressure. Certain anamnestic facts should especially lead to repeated blood pressure determinations.

# SOME FOOTBALL INJURIES TO THE REGION OF THE KNEE JOINT

Don H. Palmer, M.D.
SEATTLE, WASH.

There is no injury in football which is looked upon with more uncertainty by coaches, trainers and players than a disability in or about the knee joint. A player with a nonfunctioning knee joint is as helpless as a soldier with poor feet. He is a constant worry to all concerned in the welfare of the team, as he may be disabled on any play and the whole complexion of attack may have to be changed by a substitution.

In the modern game of football the knees are subject to all forms of stress and strain, as well as direct trauma. The constant desire to lighten the weight of equipment to speed up the individual is in a measure balanced by better types of sodded playing fields and changes in rules. However, speed and quick turning will always be responsible for many knee injuries.

Bursitis is one of the commonest findings in a player, due to the constant falling on the knees. The prepatellar and infrapatellar bursae are most frequently involved. A bursitis under the internal hamstrings or gastrocnemius tendons is not uncommon.

The prepatellar and infrapatellar bursae are often greatly thickened, and firm, hard, cord-like areas of dense tissue may be felt on the deep surfaces. These at times are loosened or broken at one end and hang free as a pedunculated mass, or may become completely detached, forming the so-called "mouse" in the sac. This condition, while not serious and easily remedied, is very disabling during a hard season, as the bursa will be painful and always more or less filled with fluid. A further trauma may rupture the bursal sac, which produces a generalized inflammation in the immediate soft parts, and compels the individual to curtail his activties. The bursal sac is frequently involved from furunculosis on the anterior surface of the knee.

Acute bursitis is best handled by carefully withdrawing the fluid with a needle, and the application of mild elastic pressure. The procedure may have to be repeated a second or third time within as many days. In the chronic form the thickened areas of the bursal sac, together with loose or pedunculated tabs, should be removed by open operation, the scar being placed well to one side of the midline.

Traumatic periostitis about the tubercle of the tibia and over the condyles of the femur is not uncommon and produces considerable disability. In either instance the periosteum may be elevated and a small hematoma formed beneath, which may be evacuated easily in the first instance. When the condition affects the condyles, it is usually associated with and masked by the fluid which forms in the joint, due to the associated trauma to the synovial lining.

An exostosis of considerable size may form which at times produces mechanical interference with the hamstring tendons and may require removal. I have removed such exostoses from the shaft of the femur which have actually eroded blood vessels in the quadriceps muscle, producing a sudden large and apparently causeless hemorrhage.

The ligaments about the knee joint are seldom actually ruptured. They are frequently the recipients of direct trauma, especially over the lateral surfaces of the condyles, and at times are subject to great lateral stress. It is this extreme lateral stress which in my opinion is the direct cause of the loosening or fracture of the semilunar cartilages.

I have had one case where the tibial tubercle was torn loose and the anterior capsule of the joint torn wide open; two cases where the tubercle alone was loosened, and two cases of fractured patellae from muscular exertion.

Injury to the internal semilunar cartilage is many times more frequent than injury to the external for two reasons. (1) The external cartilage is larger, makes a complete circle, being shaped like the letter "O," has a greater area of attachment and is subject to less stress and strain. (2) The internal cartilage is "C" shaped, firmly fastened before and behind, attached to the capsular ligament of the joint and the margin of the internal tibial tuberosity.

A driving force applied to the external surface of the knee, with the foot planted firmly on the ground, especially when the individual is unaware, creates a great strain on the inner side of the capsular ligament and through it to the internal semilunar cartilage. This force more frequently loosens than breaks the cartilage. Hence, immobilization and rest frequently restore such a knee to normal function.

I have found in such cases the injection of 3 to 5 drops of tincture of iodine under the semilunar cartilage of great value. Enough irritation is caused by the iodine to set the cartilage firm again. It affords relief to the associated pain, and best of all the patient is ambulant, no immobilization being required.

This treatment may be easily done in the office by application of the following rule. With an iodine swab draw a perpendicular line along the internal border of the patella. At right angles to this, on the level of the lower border of the patella, draw another line inward. A point one and a quarter to one and a half inches inward from the intersection will locate the under surface of the internal semilunar cartilage at its most prominent point. Thrust the hypodermic needle straight in and it will pass over the surface of the condyle, under the cartilage where the iodine is deposited.

In seven to ten days the knee will tolerate almost complete activity. Extreme flexion of the knee, such as squatting on the heels, is reserved for a longer period when all swelling has disappeared.

The cardinal symptoms of fracture of the cartilage, such as locking, severe pain, fluid, crepitus, increased lateral play in the joint and general instability, call for but one line of treatment, namely, the complete removal of the whole cartilage, together with all broken fragments, elongated synovial fringe, and in some old cases a portion of the indurated fat pad. I never operate in the acute condition. I do not advise aspiration of the acutely injured knee. Rather, immobilize in plaster of paris or a Gibney adhesive dressing until the acute condition has subsided. I never operate until the skin about the knee is normal, free from all abrasions, superficial infections or rash.

I prefer the technic of Sir Robert Jones for removal of the cartilage. Apply a firm Martin bandage from the toes to the groin, with the foot elevated. Then put on a tourniquet and remove the Martin bandage, operating with the knee flexed to a right angle, through a small right-angle curved incision, beginning just inside the internal margin of the patella and carried backward over the upper border of the tibia, the incision being about one inch in each direction. I have found a self-retaining mastoid retractor of great value. The greatest care is taken not to weaken the capsular ligament when cutting the cartilage loose from its attachment. A very small-bladed knife, with a long, three and a half inch shank and a small, sharp, curved chisel, I have found to be of great assistance.

The success of the operation depends on the thoroughness of removal of the cartilage and the minimum of trauma. From an experience I once had in my early work, I believe the cartilage regenerates in part. I removed the anterior half of the cartilage which was loose, beveling the anterior edge of the remaining posterior half. My patient continued to have trouble. About one year afterward I was permitted to do a second operation and to my surprise there had been a regeneration of cartilage, but the posterior half was loose. A removal of all the cartilage gave complete relief.

In my experience no ligations are needed. Small, moist pledgets of cotton are used for sponges. The synovial membrane is sutured with No. O plain catgut. The capsular ligament is sutured with No. 1 chromic. Three dermal sutures are placed in the skin and clips added as needed.

A firm bandage with plenty of padding about the knee is applied, and a pillow splint tied about the leg. The bandages about the pillow are cut on the fourth day and patient advised to move the knee within the range of comfort.

The patient is up and about with crutches at the end of one week, using the knee as he desires. In ten days he walks with a cane. In six weeks he is discharged for general duty and his football training, with perfect knees.

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# GIANT CELL TUMORS OF TENDON SHEATHS*

HOMER D. DUDLEY, M.D.
SEATTLE, WASH.

While tendons and their sheaths are not exempt from neoplastic attack, tumors originating in these structures are relatively rare. One of these is the so-called xanthoma or giant cell myeloma. Primary neoplasms of tendon sheaths occur as benign fibromata, lipomata, chondromata and xanthomata or giant cell extraperiosteal foreign body tumors and malignant lesions as sarcomata. Ganglia appearing as tumefactions, forming localized cystic degenerations with distention of the tendon sheaths, are not classified as new growths.

Based upon histologic findings, tendon sheath tumors have been given various names by individual investigators, several of whom have offered a theory as to their pathogenesis. There is still some controversy as to their exact classification. Stewart and Flint[1] believe they are true neoplasms, while others hold that they are granulomatous formations. Broders[2] believes "that it is justifiable to call them benign growths which are probably the result of extravasation of blood following injury or infection, as they seem to have more of the microscopic features of a granulation tissue tumor than a true neoplasm. Under no consideration should they be called sarcomata." McWhorter and Weeks[3] conclude that "all forms of xanthoma are the result of a systemic disease; hypercholesterolemia is an essential feature, and the pathology of these growths probably represents an irritative connective tissue reaction due to the deposit of cholesterin."

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* Presented before the meeting of Seattle Surgical Society, Seattle, Wash., Jan. 1930.

Foreign body giant cell tumors originate in bones and fascia. They occur most frequently in the tendon sheaths of the hand, next of the foot, but have also been found arising from tendons and fascia of the forearm and leg. They usually occur singly, and the most frequent site is at or near the metacarpophalangeal joint on the flexor surface of the hand. Cases of multiple tumors of both hands and feet have been reported. They commonly occur in adult life, although a case is reported in an eight year old child.

There is a history of trauma in the majority of reported cases. This is not consistent with the appearance of multiple lesions or when they appear simultaneously in both upper and lower extremities.

Pathologically these tumors are of great interest and present uniformly characteristic findings. They are fibrocellular in structure, are lobulated and encapsulated. All the tumors contain typical myeloid foreign body giant cells. There is also present small lymphocytes, fibroblasts, endothelial cells, mononuclear phagocytes containing golden yellow pigment and debris, with groups of xanthoma or foamy cells, cholesterol and lipoid substances. Macroscopically giant cell tumors of tendon sheaths are lobulated, encapsulated, of firm consistency and of a brownish or pinkish color. They do not metastasize and apparently there is no tendency to malignant reversion (figs. 1 and 2).

The clinical diagnosis is not easily made. The chief lesions to be differentiated are simple ganglion which is the most common, tuberculous tenosynovitis, the various nonmalignant tumors and sarcoma. The diagnosis is definitely established by the characteristic microscopic findings.

Surgical removal is the only treatment indicated. There is no recurrence if the tumor is completely excised. Amputations of fingers or extremities have been needlessly performed under the mistaken diagnosis of malignancy.

Prior to 1891 these tumors were classified as sarcomata and it was not until 1913 that Fleissig[4] first showed that extraperiosteal giant cell tumors of tendon sheaths were not sarcomata, and hence the indication for conservative surgery was established on a sound basis.

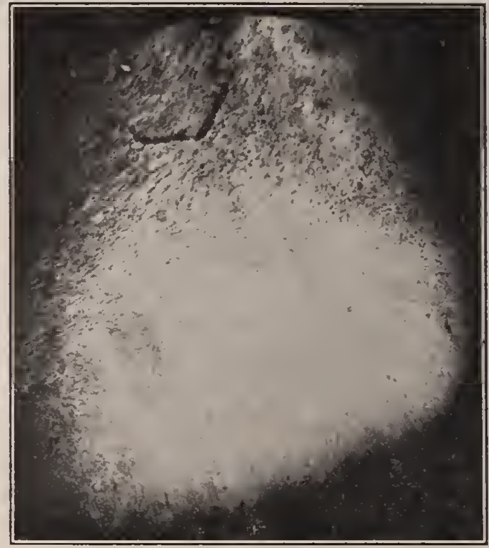

Fig. 1. Low power. Occasional giant cell. Diffuse fibrous tissue. Moderate hyaline degeneration.

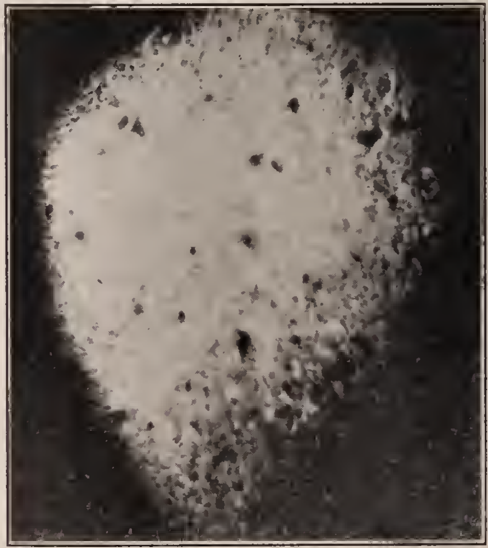

Fig. 2. High power. Multiple giant cells. Dense fibrous tissue with tendency to hyaline degeneration and fatty infiltration.

### CASE REPORT

Mrs. W. P., age 54, first noticed a small painless noninflammatory growth on the palmar surface of the proximal end of the left ring finger some time in 1923. This growth gradually enlarged, although so slowly that it attracted little or no attention, until the spring of 1928 when it was noted there was some limitation to flexion of the finger, due to mechanical obstruction from the tumor itself. About that time it became somewhat painful to pressure, when objects were grasped firmly. It was at no time inflamed. There was some tenderness to firm pressure over the tumor. There was no history of an original injury. Upon examination there was a firm irregular tumor mass located on the flexor and ulnar surface of the left ring finger, overlying its proximal phalanx. One lobule at the lower border extended past the proximal flexor crease of that finger. The skin was freely movable over the tumor. It was apparently attached to the deeper structures of the finger, although the tumor mass did not migrate with the limited excursion of the flexor tendons. There was some limitation of full voluntary extension and flexion confined to about one-half normal range at the proximal and middle joints.

On January 10, 1929, under local anesthesia the tumor was removed. It was found to be firmly attached at its base to the flexor tendon sheath near the middle phalangeal joint, involving a portion of the capsule. Apparently the growth had protruded proximally along the sheath but was attached to it only at one point. The tendons were not involved. Macroscopically the tumor was a lobulated encapsulated firm, yellowish brownish mass about two centimeters in diameter. The cut section appeared yellowish in color with occasional small pinkish areas. The microscopic section showed groups of spindle and polyhedral cells surrounded by dense connective tissue. There were multinuclear foreign body giant cells scattered through the structure. Convalescence was uneventful with full return of voluntary function and no recurrence to date.

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# TUMOR OF THE CEREBELLUM

George W. Swift, M.D.
SEATTLE, WASH.

A boy, ten years of age, entered the Children's Orthopedic Hospital, November 20, 1928, with the following history.

Two months before admittance the mother had noticed that the child vomited, especially in the morning when he first got up, complained of headache, extending from the forehead to the occiput but particularly on the right side over the mastoid. Three weeks prior to entrance the mother noticed the boy's eyes had crossed and that he complained of double vision. He had had attacks of weakness of the legs from time to time during the last few months. His vomiting, which was becoming a more and more prominent symptom, had suddenly become projectile in character.

Examination revealed a boy somewhat undernourished but a little overdeveloped. He walked normally but, when standing with his feet together and eyes closed, he fell, always to the left. He had a well developed head, with no scars on the scalp. There was no asymmetry of the face. There was tenderness over the skull in the region of the occiput.

The eyes showed double choked disc well advanced but with the physiologic cup still present and very deep, a gradually developing choke (fig. 1). There was nystagmus, both lateral and vertical, both to the right and to the left, coarser to the right than to the left. There was a double sixth nerve paresis, both eyes turning in. Hearing was normal to tuning fork, the noise apparatus being used first in one ear then the other. There was no evidence of facial paresis.

The tongue protruded in a straight line. The teeth were in excellent condition. Heart sounds normal and in the normal position. Lung sounds normal. The abdomen, while flat, did not show any signs of tenderness or masses. The muscles were all well developed for the age. There was no atrophy of any of the muscles in either arm or leg. Hoover sign was negative. There was no adiadochokinesis, no past-pointing, but a definite falling to the left.

The positive neurologic findings were slowly developing bilateral choked disc; bilateral sixth nerve paresis; definite falling to the left; projectile vomiting and headache, with tenderness over the right occiput.

A diagnosis was made of a lesion of the right cerebellum.

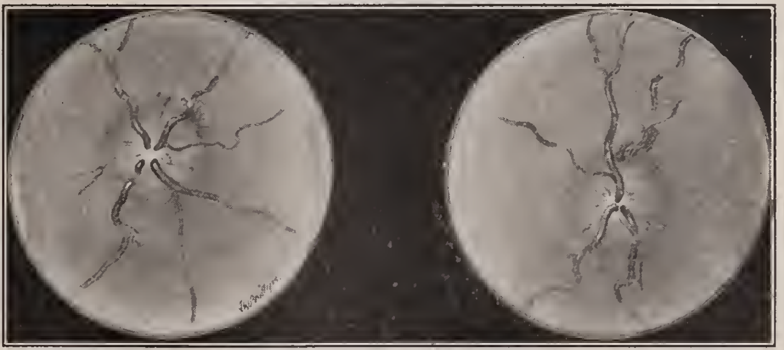

Fig. 1. Choked disc, bilateral; tortuosity of vessels; marked papilledema.

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Case of Adhesions in Right Upper Quadrant. Arthur H. Curtis, Chicago (*Journal A.M.A.*, April 19, 1930), has found that extensive adhesions between the anterior surface of the liver and the anterior abdominal wall, characteristically of the separate "violin-string" type, are not infrequently encountered in patients operated on for relief of pelvic distress incident to gonorrheal disease of the tubes. It would appear that gonorrheal disease is not so invariably limited to the pelvis as has heretofore been assumed. Female patients with symptoms suggestive of gallbladder disease or pleurisy may be suffering from liver-abdominal wall adhesions complicating a pelvic gonorrheal infection.

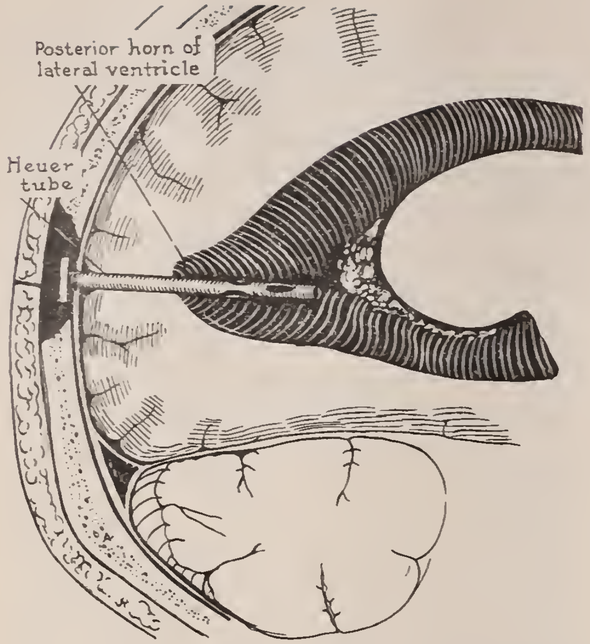

Fig. 2. Through a trephine opening into the skull and a small dural incision a ventricular needle, carrying a Heuer silver tube, is inserted into the posterior horn of the lateral ventricle, the day before operation. The tube is left in the ventricle, draining cerebrospinal fluid into the soft tissues of the scalp.

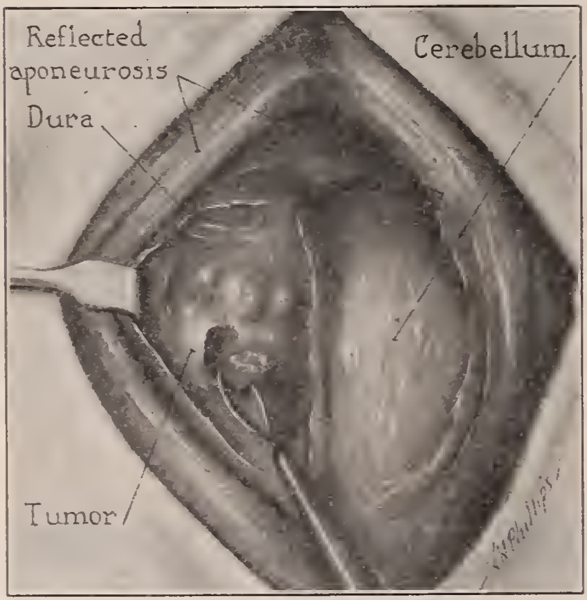

Fig. 3. Removal of cerebellar tumor with endotherm loop. At a previous operation a small meningioma had been removed.

On November 21 an incision was made under general anesthesia over the right occipital pole and a small trephine opening made in the skull, the dura opened and a ventricular needle dropped into the distended ventricle (fig. 2). A short Heuer silver tube was inserted into the ventricle and the wound closed, allowing drainage to take place under the scalp. The following day a cerebellar exploration was performed. A cyst at the site of the vermis presented itself and, after it had ruptured, a tumor mass was seen at the base of this cyst, red in color and about the size of a small marble.

The patient collapsed at this time and, after being restored somewhat with a transfusion, the wound was closed and he was placed in bed. He made a prompt recovery and on December 11 was transferred to Columbus Hospital for deep roentgen-ray therapy. He responded very promptly. After a full series of treatments had been given, he was allowed to go home. The condition improved rapidly, the tumor apparently yielding to the roentgen-ray therapy.

On August 16 the patient was readmitted to the Orthopedic Hospital, when all symptoms had returned and in addition a bulging mass over the cerebellar fossa. Dr. Dickerson operated. A small mass about the size of a hickory nut was removed from the cyst cavity. This proved to be a medulloblastoma and another series of roentgen-ray treatments was given.

The patient did not respond well and on November 11, 1929, a year from the first admission, he was again admitted to the Orthopedic Hospital, with the original symptoms pronouncedly increased. The tumor mass had again enlarged and had caused marked disturbance in the gait, in addition to the double choked disc, nausea and vomiting.

A radical operation was undertaken at this time and the tumor mass removed entirely from the cerebellar fossa. The mass had completely filled the right fossa, collapsing the cerebellum to a small nub. By means of the electrosurgical unit loop, the tumor was removed piecemeal. There was practically no reaction during the entire operation (fig 3).

The patient made a very prompt recovery. Another series of roentgen treatments was given and he continued to improve gradually. At the present time he is in school and plays about with the other children. There is a moderate degree of swelling in the occipital fossa.

The microscopic examination reported by Dr. Cefalu is as follows:

Sections show a highly cellular tumor, whose component cells vary in shape from round to oval. The nuclei are dark staining and generally compact; an occasional cell is seen having a large vesicular nucleus and dark nucleolus. Cytoplasm of the type cell is scanty and ends in an indefinite stream. No particular arrangement is followed, an occasional tendency to lobular formation being noted. By differential staining the interlobular septa are found to be of fibrous tissue. This is unusual in this type of tumor, but is regarded as a reparative effort, since sections are from a reoperation. After staining by Cajal's silver method and Hortega's "fourth variant," no definite neuro- or neuroglia fibrillae are made out arising in the type cell, but an occasional spongioblast is noted, in addition to probable large neuroblasts (fig. 4). A typical area is shown in figure 5.

The presence of both spongioblasts and neuroblasts, intermingled with the predominant cell, is explainable only on the assumption that the tumor is a bipotential one, possessing upon differentiation the power to produce both nerve and neurogliar cells. This brings their origin back to the bipotential cells, termed by Bailey and Cushing "medulloblasts," and classifies the tumor as a "medulloblastoma."

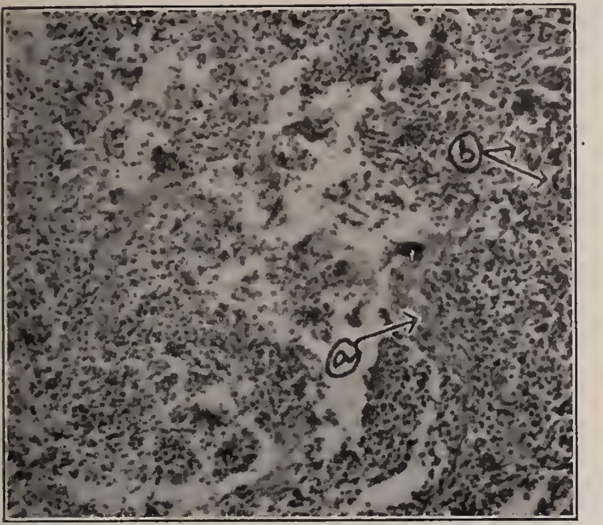

Fig. 4. Section of medulloblastoma, showing in addition to the type cell fibrous wisps(a) and probable neuroblasts (b).

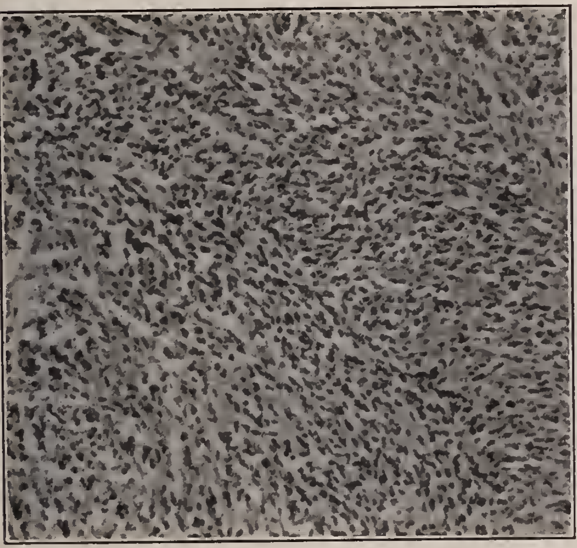

Fig. 5. Section of typical medulloblastoma, showing oval and fusiform cells in indefinite masses without stroma.

### SUMMARY

This case is of interest not only from the pathologic standpoint but also from that of the electrosurgical unit in the removal of the cerebellar tumor. Undoubtedly, had it been possible for the tumor to be completely removed at the first operation with the cautery loop, there would have been no recurrence. Unfortunately, we did not have such an instrument available at that time and the collapse of the patient, too, would have made its use impossible. At the second operation evidently the entire mass was not removed, as it began to grow rapidly immediately after. At the third operation we were able to remove the entire mass.

The electrosurgical cautery loop gives us an instrument by which we hope in the future to remove many of these tumors. This was impossible by the old method, as shock was too great, the free bleeding obscured the field and the loss of blood itself made radical surgery practically impossible.

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## SURGICAL TREATMENT OF TUBERCULOUS EMPYEMA *

### ILLUSTRATED BY THREE CASES

Oscar S. Proctor, M.D.
SEATTLE, WASH.

One of the most difficult problems with which the thoracic surgeon has to deal is the treatment of tuberculous empyema. As a rule the entire pleural cavity is infected, with the lung partially or completely collapsed, and frequently found as a small shrunken organ along the vertebral gutter. In such cases secondary infection is present, and in addition the condition is usually of relatively long standing. Degenerative changes have occurred to a greater or less extent in the vital organs, and these patients do not stand operation well. Moreover, extensive surgery is, as a rule, required before there is any prospect of clearing up the condition.

The cases coming to the surgeon may be divided into four types: First, those who have neither an external opening, nor a bronchial fistula; second, those with a bronchial fistula but no discharge of pus on the surface; third, those with an external opening and no bronchial fistula; fourth, those with both an external opening and a bronchial fistula. We are not here considering those cases which have a partial empyema, with a small well defined collection of pus. These cases, as a rule, respond to the ordinary methods of treatment.

Response to treatment and the prospect of cure are roughly in the order already set forth; that is, those cases which have both a bronchial fistula and an external opening, as a rule, present the greatest difficulty. It also happens occasionally that we are confronted with a case which is being treated by the medical man with repeated aspirations, and in which a secondary infection has set in, necessitating a thoracotomy, thus converting the case into one of the third type. By using the closed method of drainage we are sometimes able to prevent the

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* Presented before the Annual Clinic of Seattle Surgical Society, Seattle, Wash., Jan. 18, 1930.

complete collapse of the lung, and leave a much smaller cavity to be obliterated.

The things to be accomplished in the treatment include the obliteration of this immense cavity which often occupies the entire half of the chest; the arrest of the infection in the pleura; and, when possible, closure of the bronchial fistula. This must be accomplished in such a manner that no one stage will prove too great a shock to the patient's lowered vitality. After the patient has been brought into as good condition as possible, the procedure should be to do a complete thoracoplasty in stages, in order to reduce as much as possible the size of the cavity. Sometimes this will prove all that is necessary, and nature is enabled to accomplish healing in the course of a number of months. All reparative processes in these cases are slow. If cure does not take place, the patient will at least be improved, and then it will be necessary to unroof the residual cavity, produce a healthy granulating surface, and later close the defect with plastic surgery. A bronchial fistula which is resistant to all treatment will have to be left to discharge on the external surface.

The mortality is very high, and among the causes of death may be mentioned shock, wound infection (tuberculous or nontuberculous), pneumonia, and occasionally one sees a gradual decline without being able to detect any specific cause. The three cases which I am presenting illustrate the more favorable and relatively least favorable types. They all represent cures.

Case 1. R. W., age 23, has always been slender. At the age of seventeen he became sick with pain in the chest, loss of weight, cough, huskiness, chills, fever and night sweats. He lost strength and raised a moderate amount of thick yellow sputum. Entered sanatorium soon after and was there continuously. Four years ago fluid accumulated in left chest and soon became purulent. The pus was aspirated and acriflavine treatment used, which seemed to help a little. At this time he had a continuous high fever for nine months with several severe hemorrhages. Altogether he has had one hundred hemorrhages. Pneumothorax was attempted but was unsuccessful. There was no bronchial fistula, nor any external openings, and the case was a tuberculous empyema without mixed infection. Two years and a half ago his condition had improved to what was considered the maximum. His right lung was in good condition, with arrest of whatever involvement there was present. The left lung was about two-thirds collapsed, with the rest of the chest containing pus which was spirated at intervals.

Two and a half years ago a phrenicectomy was done, followed by a series of five thoracoplasties. One inch of the first rib was removed, and the entire length of all the other ribs as far as the costal cartilages. Recovery was uneventful and gradual, and for the last year or more he has been in reasonably good health; he is free from symptoms, has gained weight, and his strength is fairly good. He is doing light work (fig. 1).

Case 2. A. S. presented himself first in 1927, at which time he had been sick for three years. For the preceding six months he had had pleurisy, with loss of weight and strength, huskiness, chills, sweats and chest pains. He was raising a moderate amount of thick sputum. His right lung was in good condition, and artificial pneumothorax was used on the left side, and continued for a period of over a year. At this time fluid developed in the chest which became purulent. There was not at any time a bronchial fistula nor any external opening. A phrenicectomy was done, followed by an ordinary two stage posterior

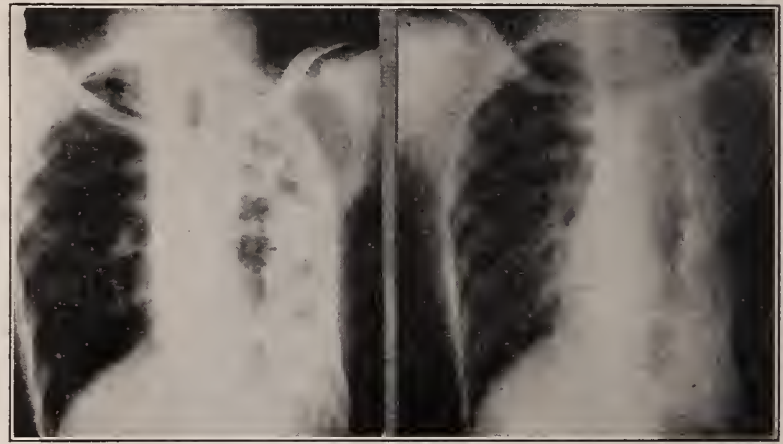
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Fig. 1 Case 1, R. W. a, before operation; b, one year after completion of operation.

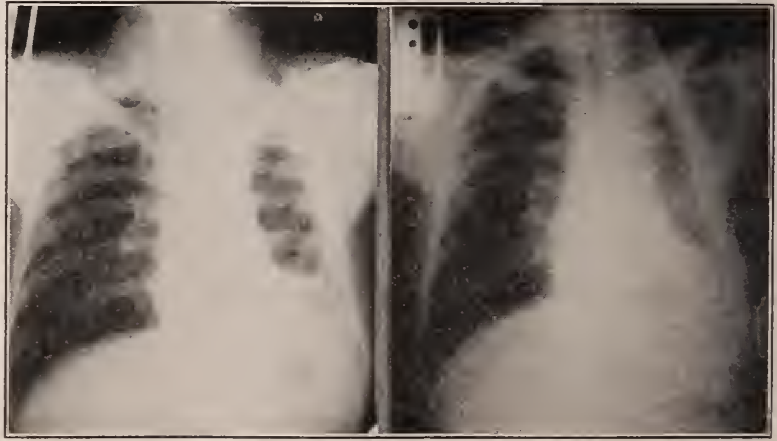
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Fig. 2. Case 3, S. L. a, before operation; b, after operation.

thoracoplasty. The anterior ends of the ribs were not resected, because it was not considered that it would be necessary to accomplish a cure. His recovery was uneventful, with gradual gain in weight and strength, and for some months he has been doing light work. He looks and feels well.

Case 3. S. L., age 33. Onset of tuberculosis eight years ago. Seven years ago he had pleurisy with effusion on the left side. At this time he had pain in the chest on breathing, cough, raising of sputum, and loss of weight, together with the usual symptoms. He was considered a far advanced case.

Six years ago pus started discharging spontaneously from the left side, rather high in the axilla. Four years ago he started raising pus through the mouth, with closure of the sinus. From then to the time of his operation the pus came through the mouth and the sinus alternately. If the sinus were healed, it would come through the bronchial fistula, and occasionally the bronchial fistula would become closed and the sinus would reopen. He raised about a cup full of yellow pus a day. He had an apparently good lung on the right, with the left lung collapsed, and the rest of the chest more or less filled with pus, depending on the drainage (fig. 2).

Here was a case with a large bronchial fistula, following a spontaneous perforation of the chest. The operations, consisting of a phrenicectomy and multiple rib resections, were completed two years ago, and for the last year he has been up full time and working as a barber. He feels well, and is free from any symptoms. Occasionally he raises a small amount of sputum. The sinus has remained closed.

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# THYROIDECTOMY PLUS THYMECTOMY

Brien T. King, M.D.
SEATTLE, WASH.

The association of enlarged thymus with exophthalmic goiter caused much confusion among early workers, and at present remains an enigma for which no satisfactory explanation has been advanced. Considerable is known at present concerning the normal and pathologic physiology of the thyroid, but practically nothing of the physiology of the thymus. The case here reported offers no solution for any of the above problems. It is presented for the purpose of calling attention to a complicating situation which was encountered during the removal of a recurrent exophthalmic goiter.

Mrs. W. came from a neighboring state and was taken from the train by ambulance to the hospital in July, 1928.

*History.* Age, 26, married. One child, age 2. Had been a healthy active girl. No serious illnesses. Was well to one year previously, when she developed the typical symptoms of a severe type of exophthalmic goiter, namely, enlarged thyroid, loss of weight, tremor, marked tachycardia, muscular weakness, sensitiveness to heat, excessive sweating, increased appetite and intermittent attacks of painless diarrhea. Six months before she had had a partial thyroidectomy with marked improvement, though not a complete remission of symptoms. She had gained weight. Three months previously symptoms had become more pronounced and have gradually reached or surpassed their former severity.

*Physical examination* revealed a young woman with a moderate degree of exophthalmos, muddy complexion, recent scar over thyroid. There was a typical diffuse hard enlargement of the gland with throbbing carotids. The vocal cords were normal and active. The lungs were clear. Heart showed marked increase in rate and force of beats, regular and competent. Slight soft systolic murmur over the mitral area. There was marked pulsation of the abdominal aorta, but otherwise the abdomen was negative. Reflexes normal. Fine tremor grade three. Muscles and tissues very soft. Skin abnormally moist. Pulse 120. Blood pressure 140/86. Basal metabolic rate plus 55 per cent.

*Operation* revealed a typical diffuse hard hyperplastic gland which was resected without difficulty. During the operation a hard column of glandular tissue about one centimeter in diameter was observed in contact with the lower border of the isthmus. It appeared to be a lobulated mass of what was first thought to be thyroid tissue, not dissimilar to the frequently encountered pyramidal lobe, except that it was on the lower border of the isthmus. It lay directly in front of the trachea. A thin layer of connective tissue capsule surrounded the mass.

When this was opened, the tissue appeared to be glandular, but more friable than thyroid tissue, and of a slightly different texture. It was also observed to extend into the mediastinum and further exploration revealed that the mediastinal was much larger than the cervical portion. A section of the tissue was removed and the pathologist promptly reported carcinoma.

As the mass appeared to be rather loosely attached and undoubtedly glandular in structure, its surgical removal seemed possible and was deemed advisable. There could no longer be any doubt of the thymic origin of the mass. The index finger was passed gently and rather easily between the manubrium and the gland, the lower border of which was attached to the anterior surface of the pericardium about three inches below the suprasternal notch. The finger could also be passed rather easily between the trachea and the gland which separated without difficulty from the trachea, arch of the aorta and pericardium. Laterally the gland lay in contact with the innominate and carotid vessels, and on the left side with the recurrent nerve. Along its lateral borders was a plexus of veins. The gland could be dislodged upward sufficiently to make ligation of these vessels possible. Practically no bleeding was encountered, nor was there any special difficulty in its removal.

The only disconcerting incident was that a small piece of tissue no larger than a pea tore from the gland and remained attached to the pericardium. It resisted every effort to secure it. As the entire procedure had consumed one and one-half hours, I felt it best to discontinue and remove this small bit of tissue in one or two weeks by a more direct route.

The patient made an uneventful recovery. In the interim, the pathologist changed the diagnosis to normal thymus tissue.

The specimen removed weighed 48 grams. The accompanying illustration is a drawing of actual

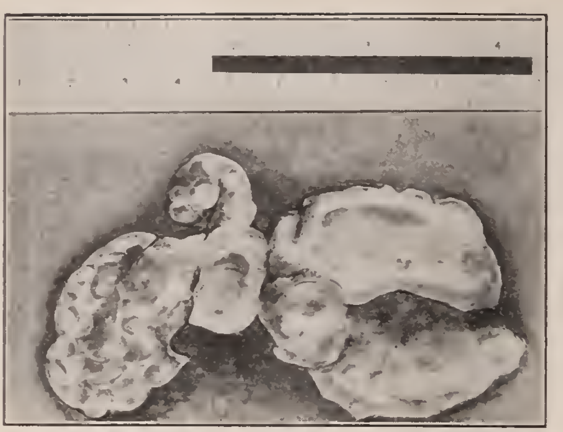

Fig. 1.

size (fig. 1). When last heard of one year later the patient had made a splendid recovery, had regained her normal health plus twenty pounds weight and was entirely free of symptoms.

COMMENTS

A history of this patient taken subsequent to operation revealed none of the usual symptoms associated with enlarged thymus during childhood or later years. She had not had attacks of dyspnea, cyanosis, stridor or coughing spells, no symptoms of tracheal compression, etc. There was nothing in the history or physical development to indicate at what period of life the thymus became enlarged. From the Mayo Clinic and other sources reports have been made of the frequency in which persistently enlarged thymus glands were encountered at postmortems on patients who had died of exophthalmic goiter. The percentage varies in the neighborhood of 15 per cent.

I have examined several hundred exophthalmic goiter patients with fluoroscope or roentgen plate or both and have not made a diagnosis of enlarged thymus in an adult. Probably it was overlooked in some instances. In 1400 operations upon the thyroid this is the only one where the thymus was encountered. Many substernal goiters have been removed and the mediastinum partially explored. However, substernal goiters are practically always adenomatous.

The frequency with which an enlarged thymus has been found in an apparently healthy individual who died suddenly from some minor disturbance or trauma, such as anesthesia, tooth extraction or tonsillectomy, has placed the patient with enlarged thymus in an unfavorable surgical category. No satisfactory explanation has been given for the cause of death in this group of individuals but the fact remains that many tragic deaths occur among them, and in some their hold on life is by a thread which is easily snapped.

A study of the physical characteristics of these people has resulted in certain efforts at clinical classification. Some new words were coined to fit them, namely status thymicus, status thymolymphaticus and status lymphaticus. These terms have survived in a half hearted sort of way and some ill defined and confusing clinical pictures have been built around them.

Few clinicians feel secure of a diagnosis by any of the names. The one important point in the group is the presence of an enlarged thymus and it may indicate a low threshold on life.

In a number of institutions all the newborn and quite a large number of children up to seven years have been examined for enlarged thymus. The percentage has varied from 3 to 12 with an average of 7 or 8. An enormous number of children in this age limit annually undergo various surgical procedures with anesthesia, who have had no investigation relative to enlarged thymus. It is certain that lives could be saved by such a routine investigation. The thymus is largely a lymphoid structure and like other lymphoid tissue is very susceptible to roentgen therapy.

I do not report this case with the idea of recommending surgical removal of the thymus, but simply to relate an interesting surgical experience and review an infrequently discussed subject. Roentgen therapy is so highly efficient and so simple compared with surgery that it should be used in all cases with the possible exception of that .in which suffocation seems imminent from thymic pressure.

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# THE CAUTERY FOR SURGICAL CANCER*

Donald V. Trueblood, M.D.
SEATTLE, WASH.

He must be indeed bold and extremely optimistic who would in the face of the popular new treatment for cancer, and against a publicity fostered by a powerful newspaper syndicate of a million copies daily, dare to offer a few suggestions as to how to treat cancer surgically. Such a one, knowing that the extract treatment for cancer has in a surprisingly few weeks attracted the attention of the entire world, would surely not expect to obtain for his article an audience of many. Doubtless those professional men, who have from at least a photographic point of view, shown interest in this new cancer cure epidemic, will not lend an ear, let alone a face, to these unillustrated pages, but the writer, being never brave and usually pessimistic, offers this subject because he appeals to reason and not to faith.

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* Read before Seattle Physicians' Journal Club, Seattle. Wash., March 26, 1930.

Faith does not have to be wooed. She can be quickly won through the emotions. But reason is cold, requiring much courtship based on logical thought before she responds. She abhors publicity and emotional enthusiasm. She delights in facts.

Surgery with the cold knife has long been the procedure of choice for operable cancer. This selection on the part of surgeons has been based entirely upon results over years of application, but still, even though there is an agreement on this point, there is much to be desired, for no matter how radical the operation has been or how adequate the dissection, recurrences will appear in the operative area. These recurrences mean only one of two things; either the cancer that was there at first was removed, or it was not there at first but was planted by the surgeon.

We know that cancer cells can be grafted in non-cancerous areas by operative manipulation and also that cancer areas are easily overlooked by the surgeon, so that either or both of these surgical accidents may occur. Many lives would be saved, if these discouraging results could be eliminated. Toward this end let us investigate the advantages of the cautery.

It has long been known that heat destroys tissue, cancerous as well as normal, but the former more easily and quickly. If heat could be applied to the cancer, preserving the normal tissue, the problem would easily be solved. The difficulty is, however, to reach all of the cancer. Hippocrates treated malignant disease with heat but nevertheless the patients were not cured for the simple reason that, though he destroyed the tumor, he failed to remove other cancer bearing tissues.

Since that ancient time surgery has made great advances which are too well known to be recounted here. The last great step, as far as cancer surgery is concerned, the application of radical procedures which were designed to successfully remove all cancer bearing tissue within the operator's reach, has failed to eliminate discouraging recurrences in the operative area.

Knowing that heat will kill cancer cells and the cold knife can plant them, it seems more than logical to consider the use of a knife that is equipped with heat sufficient to destroy cancer and which could not possibly transplant it. But such an instrument must lend itself to accurate dissection or else the advances offered by the radical operations would be lost.

Scott of Temple, Texas, and Percy of Los Angeles, have for many years advocated and used some form of cautery instrument for cancer operations. While they differ as to the type of instrument used and in some details of technic, yet their choice of this procedure in cancer is based on the same solid foundation of heat destroying cancer and preventing transplantation of cancer cells. The instruments which they use permit them to do as accurate and complete a dissection as can be accomplished with the knife, so that their patients have the full advantage of all the advanced steps of modern surgery with the additional protection of having all cancer cells destroyed, which exist beyond the tumor site and within the limits of the operative field. It seems that the logic of such a method is irrefutable and their results show that they have fewer local recurrences.

In the last five years several manufacturing firms have placed on the market different types of radio frequency cauteries, many of which have been improved to the point where they serve very satisfactorily as a hot knife for surgical dissection. The writer has used such an instrument in twenty-six cases of cancer and, while it is too early to report the infrequency of recurrences, yet in every instance dissection was complete and first intention healing was obtained. The ultimate advantage to be gained by using cautery in cancer surgery cannot be accurately prophesied now. It will only be known after many surgeons have used the method over a period of five or ten years, but I believe the foundation, upon which the advocacy of the procedure depends, causes it to be classed at this time as one of the most promising forward steps that has been offered to cancer surgery.

Inasmuch as the cautery technic offers to the patient all of the advances that have marked the progress of surgery and in addition presents a more extensive and accurate destruction of the cancer and removes the possibility of cancer implants, it is a procedure to which individuals, afflicted with this dread disease, are entitled upon the basis at this time of reason alone, allowing time to offer verification by results.

625 Medical-Dental Building.

# THE UTERINE CERVIX AS A FOCUS OF INFECTION

W. C. Woodward, M.D.
SEATTLE, WASH.

That the infected cervix of the uterus is a focus of infection is well known, but it does not seem to have reached the general medical consciousness in the way it should. In one large clinic I saw a cervix which was two inches in diameter and studded with cysts, but which was not operated upon because the surgeon said it was perfectly smooth externally. The teeth, tonsils, gallbladder and prostate get their share of attention, sometimes more than their share, but the cervix for some reason seems to be slighted. Therefore, I am giving a resume of some of the diseases which can originate from an infected cervix, hoping the repetition will be of interest.

Anatomically the cervix consists of branched glands, emptying by narrow ducts into a central canal. These glands are longer than is generally supposed, some of them reaching from the central canal to the mucous membrane on the vaginal side. Any trauma, such as instrumentation, miscarriage or confinement, may injure the supporting network of connective tissue and lead to poor drainage and consequent infection of these glands. The surrounding lymphatics spread along the blood vessels and the majority of them extend through the body of the uterus. This point will be referred to later. Bacteriologically we find streptococci, colon bacilli, staphylococci, gonococci and various combinations of these organisms. One sees from this brief resume the extreme accuracy of Gellhorn's reference to the cervix as the "pelvic tonsil."

Some of the diseases which are mentioned originating from an infected cervix are as follows:

*Mental diseases*. The best series is that reported by Langstroth.[1] He found that in twenty-one cases of mental diseases the patients were improved by amputation of the cervix. Of these seventeen were discharged as cured. This improvement followed as a result of an operation on the cervix. All had had some previous work done on diseased teeth, tonsils, etc. without benefit and responded only when the infected cervices were removed.

*Skin diseases*. There is no large series of these but there are isolated cases, as one reported by Dickinson,[2] of recurrent attacks of urticaria, treated successfully by an operation on an infected cervix.

*Joint involvement*. The best known report of this group is that by Moench,[3] who cites her studies of eighty-two cases of leukorrhea, showing a large percentage of joint involvement. She proved by animal experimentation and the relief of patients from the use of vaccines made from cervical bacteria, together with results of operations, that the infected cervix was a causative factor.

*Neuritis*, especially sacrosciatic neuritis.

*Renal diseases*. These range from actual nephritis to foci of infection in any part of the urinary tract of women. Dr. O. A. Nelson of Seattle considers it useless to expect a cure of a urinary tract infection until concomitant infections are removed. See also an article by Soufer[4] in this same connection.

*Eye diseases*. Many chronic eye conditions have been relieved by operation on diseased uterine cervices. Moench has an article summing up several of these cases, referred to by Mayo.[5]

No paper on this subject would be complete without reference to the possibility of the development of cancer in the untreated diseased cervix. To mention chronic infection and irritation is enough to interest all of us in the proper care of this condition.

There is the hypometabolic type, where the woman is distinctly below par, with cold hands, cold feet; is thin, pale, easily tired, frequently called neurotic; these patients usually have a profuse leukorrhea. They are the ones who come for vaginal treatments as they realize that when the cervix is clean they feel better for a short time. They are much relieved by the removal of diseased cervices.

The local effects of cervical infection have been particularly stressed clinically in Seattle by Dr. Richard O'Shea and by Dr. D. H. Nickson in his laboratory investigations. They have shown that the uterus is involved as a result of an infection of the cervix, due to the fact that a large share of its lymphatic drainage goes through the wall of the uterus. They trace three types of results. The stage of early infection is characterized by menorrhagia and sometimes metorrhagia, large boggy uterus, frequent attacks of pelvic pain, especially after menstruation. Later a second stage shows beginning atrophy with lessened menstrual flow, hard white uterus, fibrous in character, and many systemic manifestations as outlined above. The third stage of atrophy of the uterus resembles the senile type, characterized clinically by early menopause, with all its concomitant symptoms, often in young women thirty to thirty-five years of age.

I do not think this aspect of the question has been stressed enough. I believe that attention to the first stage of this condition would prevent the sterility and early menopause, and change the whole afterlife of these women.

As to the treatment I prefer amputation by the Sturmdorf method. The use of the surgical electric knife gives a much more rapid means of doing this operation and lessens the bleeding. What bleeding does occur may be taken care of by the coagulation tip on the same machine. The use of the actual cautery, such as the Post cautery, I have not found so valuable, although it can be used in the treatment of superficial erosions. The use of injections into the cervix of dyes, alcohol and other antiseptics has not proved satisfactory in my hands. Conii[6] reports enthusiastically the use of the electric cautery. Of the local treatment so-called, tons of tampons, pails of silver nitrate and barrels of iodin, let us only reverently refer to them as historically interesting and allow them to sink in innocuous desuetude.

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1414 Medical-Dental Bldg.

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# RECTOVAGINAL ANOMALY

## CASE REPORT

Walter C. Lippincott, M.D.
SEATTLE, WASH.

Case, number 6284, Children's Orthopedic Hospital, is interesting and instructive because it is unusual.

The patient was a girl, age 12, who had not yet menstruated. There was no knowledge of a similar condition in her family history. She was a full term, breast fed baby and had only the usual diseases of childhood, with the exception that there was a suspicion she might have had infantile paralysis, though no signs or symptoms of such were apparent at the time of her examination at the hospital in March, 1929, when she was admitted.

Physical examination showed a girl of normal weight, height and nutrition, with no abnormal condition except a congenital absence of rectovaginal septum. This condition was discovered when she was a baby. She was operated on at the age of 18 months, giving her, it was said, a partial rectal control.

A search of the literature failed to discover a similar case. The nearest approach was one reported by Frank in *Kentucky Medical Journal,* May, 1925, and was unusual "in that the cloaca had never completed the formation of separate vaginal and rectal structures, the rectum emptying directly into the posterior vaginal wall." This child of 16 months had a stenosis of the rectal opening and a consequent enlargement of the sigmoid.

In our own case, local examination showed a thin wall of mucous membrane between the vagina and rectum, but not extending outward as far as a normal perineum. The uterus and adnexa were normal. The rectal sphincter could not be located at the time of examination, and the vagina and rectum formed one large opening except for the above mentioned membrane. She had no control of the bowels. There was a little scar tissue on either side of the opening evidently the site of her early operation. An operation was suggested with guarded prognosis.

On March 14 she was operated upon. Under ether anesthesia a rectal sphincter was discovered, extending about 100° posteriorly. The membrane between the vagina and rectum was divided horizontally into an upper and lower sheet, one and one-half inches deep.

A crescent shaped incision was made in front of the rectum with its concavity posterior. The sphincter pits were opened and the sphincter freed of adhesions and stretched. One silkworm gut suture was placed through the ends of the sphincter, being tied at the completion of the operation. The gap in the rectal mucous membrane was sewed with catgut from above, and the ends of the sphincter were brought together with two chromic catgut sutures. The levator ani muscles were then brought into view and united with four interrupted chromic catgut sutures after the field had been swabbed with mercurochrome solution. Two rows of continuous catgut sutures were then placed through the muscle and scar tissue, bringing the right and left sides of the perineum together. In other words, the transverse incision and deeper tissues were sutured together so as to leave a vertical scar. The vaginal mucosa was sutured with continuous plain catgut and the skin with the same material. One deep perineal silkworm gut suture was inserted.

After the operation the perineum appeared to be quite normal, but the rectal sphincter was very small and tight, this fact causing some anxiety. The bowel movements were kept soft for several weeks by administering nujol by mouth and oil enemas.

After the operation she developed a rectovaginal fistula which at first appeared to call for operative interference. She was discharged from the hospital April 7, with a request to return for observation, and possibly operation for the fistula. She returned to the hospital clinic May 21 and was found to be in good condition with the site of operation healed.

Another examination was made February 25, 1930, when she was found to be well nourished and in good condition. The fistula had healed, she had normal sphincter control, the perineum was intact, and the vaginal wall was firm and normal. The distance from the lower edge of the vagina to the rectum was one and one-quarter inches. The menstrual function had become established and her mental attitude was cheerful and normal.

It is possible that the ready healing following this operation was facilitated by the youth of the patient, a factor not usually present in adults in need of secondary repair for third degree lacerations.

## REGURGITANT VOMITING FOLLOWING GASTROENTEROSTOMY*

William C. Speidel, M.D.
SEATTLE, WASH.

Regurgitant vomiting, or so-called "vicious circle" following gastroenterostomy by the posterior route, is fortunately infrequent but so serious as to cause grave consideration when present. It is with that in mind that this case is presented.

Of the frequency of regurgitant vomiting, the following figures give some indication: In 65 patients operated upon by Czerny, one only presented grave symptoms of regurgitation. In 74 patients operated upon by Mikulicz, 7 died of regurgitant vomiting. In 215 patients of posterior gastroenterostomy from the Heidelberg clinic there was not a single case of reflux vomiting. In 21 cases of anterior gastroenterostomy there were three in which enteroanastomosis was necessary.

Patient, A. V., female, single, 38 years of age, laundress, gives a history of having been troubled for several years past with attacks of indigestion. These attacks take the form of pains in the epigastrium after meals, relieved by taking bicarbonate of soda and food. Her final attack, lasting six weeks, was not relieved by anything.

Past history. Measles, mumps, whooping cough and usual constipation. Family history, negative.

Pupillary and general reflexes normal. Normal range of pulse and temperature, blood pressure, blood and blood Wassermann. Definitely tender on pressure in midepigastric area. Gastrointestinal roentgen-ray findings read duodenal ulcer with a shadow strongly suggesting penetrating type of ulcer; actual picture infiltrating ulcer of lesser curvature on gastric side of pylorus.

Operation, Jan. 9, 1930. Gas-oxygen-ether anesthesia. Right rectus incision revealed ulcer of lesser curvature near pylorus. Usual procedure followed of posterior gastroenterostomy by suture method without clamps, a three inch opening being made and additional interrupted safety stitches being taken at both ends upon completion of the anastomosis. The mesocolon was anchored to the stomach side of the union. Usual closure of abdominal wound.

Immediate postoperative condition was good, 2000 c.c. of normal saline being injected under skin and 1000 c.c. of 5 per cent glucose per rectum. Jan. 10 condition was good; Jan. 11, considerable pain in epigastric region; Jan. 12, considerable amount of dark brown emesis with foul odor, poor day. Jan. 13, very restless, considerable distress, nausea, gas pains, and pains in epigastric region. Jan. 14 patient very weak and exhausted, emesis of very black liquid with fecal odor.

Patient was taken to surgery with preoperative diagnosis of intestinal obstruction. Spinal anesthesia with spinocaine. Operative findings were afferent loop edematous, swollen, "water logged," no leak. Gastroenterostomy was uncoupled, and a shorter no loop gastrojejunostomy performed, using the original opening in the stomach. On suturing the original opening in the small bowel the lumen was so narrowed by the procedure that it was deemed advisable to do an enteroanastomosis close by, in order to insure patency. A 620 c.c. blood transfusion was performed as a conservative and sustaining measure. The operative wound was closed by interrupted silkworm gut. Patient was returned to room and given 2000 c.c. saline under skin and 1000 c.c. 5 per cent glucose per rectum.

Jan. 15. No pain, no nausea; record shows a good day. The condition steadily improved, convalescence was uninterrupted and patient was discharged from hospital twenty-two days after admission, wound healing by first intention.

By way of comment Moynihan states it as his belief that regurgitant vomiting is due to a mechanical defect in the operation. This consists mainly, if not solely, in leaving a loop of jejunum between the flexure and the anastomosis. This loop becomes water logged; the bile and pancreatic juice distend it, being unable to escape from it into the distal limb. Regurgitation through the pylorus then occurs, or the weight of the heavy loop causes a kink at the anastomosis which closes the entrance to the distal limb.

Mayo stresses the importance of making the gastric opening at the lowest point in the wall of the stomach. As mentioned before, this accident is rare following posterior gastroenterostomy. This case is presented to emphasize the importance of making a short loop.

The treatment of grave regurgitant vomiting must be an operation.

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**Fatal Post-transfusion Reactions.** In a series of 4,000 transfusions of unmodified blood reported by Osborne Allen Brines, Detroit (*Journal A.M.A.*, April 12, 1930), the mortality was 0.5 per cent. Incompatibility of blood was apparently not a factor in the production of these reactions. Cross agglutination of the blood of the donor and that of the recipient is superfluous provided the direct matching is properly done. The universal use of group IV donors is strongly advocated as a means of preventing accidents and reducing the incidence of post-transfusion reactions. The blood group of an individual remains constant throughout life. The negligible mortality directly attributable to blood transfusion compared with the results obtained argues well for the efficacy and safety of this form of treatment.

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* Read before a meeting of Seattle Surgical Society, Seattle, Wash., March 28, 1930.

# ADHESIVE PLASTER

## ITS USE AND ABUSE

Park Weed Willis, M.D.
SEATTLE, WASH.

Any treatment that is universally used by patients of their own volition is very likely to have some merit. So I believe that porous plaster has its uses and has given some relief, not usually from any direct medicinal effect, but more likely from the support that it gives to the parts involved. The manufacturers of adhesive plaster have improved their article to such an extent that now we can use what is known as zinc oxide rubber adhesive without much irritation to the skin. This is true with the average patient. Some people are very sensitive even to the modern product and they must be left out of the question, when it comes to the use of plaster, at least of this form.

There are many conditions that are greatly relieved by proper application of adhesive plaster, as sprains of joints, sprains of muscles, sometimes bruises of groups of muscles, fractured ribs, bruises of the chest and sprain of the intercostal muscles, leg ulcers, scratches, abrasions, cuts that are not sufficiently deep to require sutures, varicose veins. The treatment of sprains of joints has been revolutionized during the last thirty years by the proper use of plaster. The improper use, however, still causes considerable trouble.

The most common improper use is placing it around the entire circumference of the limb. It does not stretch and will easily cut off the circulation sufficiently to give discomfort. Strapping entirely around the chest, when we should leave one side to do the physiologic work while the other is held with the plaster, is another improper use; also strapping too high on the chest in the armpits so that it interferes with the use of the muscles and is annoying at either the anterior or posterior axillary fold or both. A common mistake, too, is to place one or two strips of plaster on the injured side of the chest, when as nearly as possible the whole side should be held firmly to prevent any unnecessary movement.

An ankle can be strapped in accordance with the original description as given by Gibney, in which the plaster is brought down along the side of the leg and around the foot, but not coming quite to the middle of the top of the foot, and then down the other side of the leg in the same manner. Another piece goes around the side of the foot and toward the base of the toes. Alternating these strips of plaster will produce a boot with overlapping near the ankle joint, leaving space in the center of the foot and ankle for the return of circulation. This plaster can be held with a bandage so that the edges will not turn up. It is well to put a strip lengthwise across the ends of the plaster also, as this prevents the corners turning up. This plaster can be left on for anywhere from one to four weeks. The longer it remains the less it will disturb the patient in its removal, because the secretion beneath the plaster will loosen it in time. The patient can take a general bath with plaster on the ankle or any other part of the body, then blot with a towel and dry it, and the plaster will remain undisturbed.

A sprain of the knee can be handled well by strapping with adhesive, beginning very high on the thigh and extending it down across to the middle of the opposite side of the leg, after shaving both thigh and leg. Start the first one on the inner side of the thigh and the next on the outer side, making them cross at the knee in the region where the greatest trouble is, usually over the internal lateral cartilage. Perhaps two or three strips can be placed in this way and then a few crosswise but going only to the hamstring tendons on either side, thus again leaving freedom for circulation. This can be held by a bandage temporarily. The bandage will stretch and not interfere with circulation and it can be removed as soon as the plaster is well fastened to the skin or it can be left on if the patient so desires. Before taking a bath, however, it is necessary to remove a cloth bandage.

A shoulder sprain and one of the elbow and wrist can all be strapped in this way. Often a Colles' fracture without displacement can be strapped and it is a good way to treat such fracture during the fourth week. The use of adhesive plaster on a sprained joint or fractured bone is good because, while it holds the parts steady, it still allows freedom of motion in the joint.

In the sprain of an ankle joint with the use of adhesive we hold the ankle bones together with the plaster outside, which naturally leaves the torn, ruptured ligaments free without any pull on them, so that they will heal quicker and with less pain. A sprain of the muscles of the back and lumbago get very distinct relief from the use of adhesive plaster.

Pregnant women often complain from varicose veins, and sometimes others will have one that is particularly tender. Simply strap this vein, leaving the strapping on a week or two, and the soreness will be gone. Sometimes a pregnant woman will require repeated strapping until after delivery. In all these cases it is important not to allow the strapping to go entirely around the limb.

Small scratches on the fingers, particularly on places where they are continually torn open by movements, can be healed promptly by the application of adhesive plaster after proper cleansing of the wound.

One of the best uses of adhesive plaster is in the strapping of leg ulcers. If it is not too old, hard and rigid, and the skin is not too sensitive, they can all be healed by the repeated strapping with adhesive plaster. The first strapping will need to be repeated the next day. After a few days the discharge will be less and it can be strapped every other day. Soon they will go three days and finally for a longer period, depending on the amount of discharge. Many ulcers will heal very promptly with this treatment. In those due to varicosities of the veins it is often necessary to place the strapping over the veins below the ulcer to support them, and extend it also a little above. We also use plaster instead of pins in fastening bandages. By putting a narrow strip of plaster lengthwise over a bandage on the forearm, it can be held in place to support dressings.

Following a laparotomy it is my practice to strap the lower abdomen tightly across the pelvis, continuing a solid strapping to the top of the dressing. This supports the abdomen in breathing and coughing, and prevents unnecessary movements of the peritoneum which causes pain to the patient. After the wound has healed and the stitches are removed, I often put one or two strips of adhesive across the front of the abdomen over the wound to support it. This gives confidence to the patient and proper support of the scar.

In little babies with umbilical hernia a strip of adhesive plaster with a piece of cork in it and a little piece of plaster over the cork, extending an inch to either side to prevent the plaster sticking around the navel, will hold the hernia and when it is necessary to remove, the plaster can be put on in a different direction. By changing directions of this plaster and teaching the mother the use of it, these hernias can practically all be healed within a reasonable length of time.

Then, of course, there are several other uses that are very common, as the Buck's extension on the leg, and the use of adhesive plaster about fracture dressings generally. A very good dressing for a fractured clavicle is to hold the upper arm back with the plaster that will go around the back and side of the chest, and bring the elbow forward and up with the use of another piece from the back around to the front.

The two particular points I would like to bring out are the value of adhesive plaster in strapping leg ulcers, and the too common fault of placing the adhesive plaster directly around the limb, thus making a painful condition from unnecessary constriction of the circulation.

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# CHRONIC CHOLECYSTITIS*

C. E. Hagyard, M.D.
SEATTLE, WASH.

It is now recognized that in a very considerable proportion of patients complaining of chronic dyspepsia the symptoms have a basis of inflammatory pathology, involving the gallbladder and closely associated organs. Hurst says "cholecystitis is the most common abdominal disease." Judd reports operation on the gallbladder as being the commonest abdominal operation in the Mayo Clinic. Recognition of the earlier symptoms of cholecystitis and more accurate diagnostic methods have placed this condition first as a cause of chronic or recurring dyspepsia.

## ETIOLOGY

With increasing study of the function and pathology of the liver and biliary apparatus, there has been a gradual evolution in our ideas concerning the methods of infection.

1. Earlier work showed the presence in the gallbladder of bacteria commonly found in the intestine, particularly bacillus coli and bacillus typhosus. It was, therefore, inferred that these bacteria, reaching the gallbladder by way of the bile ducts, caused the infection. At the present time it is considered improbable that bacteria in the gallbladder cause cholecystitis, though they may have some action on the bile increasing the tendency to cholesterin precipitation, thus increasing the opportunity for gallstone formation.

2. Hematogenous infection. Doerr injected bacteria into the veins of rabbits and recovered them from the gallbladder in a few hours. Abrami injected bacillus typhosus into the veins of rabbits' ears and found they were constantly eliminated by

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the liver into the bile ducts and caused a transient cholecystitis.

3. Rosenow demonstrated experimentally the specific affinity of certain strains of streptococci from abscessed teeth or infected tonsils for the gallbladder, when these bacteria were injected into the blood stream.

4. The work of Graham, confirmed by Moynihan and others, makes it certain that hepatitis is usually associated with cholecystitis and probably is the earlier condition. The liver is known to have an important function in the destruction of bacteria brought to it by the portal circulation from the intestinal tract. When, however, like the tonsil, it is subject to repeated or long continued invasion by pathogenic organisms, it not only suffers but proves an ineffective barrier to the passage of these organisms to other structures. The extension of infection is probably most common along the lymphatics to the subserous layer of the gallbladder and to closely associated structures, such as the duodenum, stomach and pancreas.

The appendix is usually considered the important primary source of infection in the intestinal tract. In this report I wish to call attention to chronic colitis as a more likely cause. The appendix in many of these cases has been long removed, in most others is inactive, while chronic colitis runs a chronic course with frequent exacerbations. The pathologic changes resemble those in the gallbladder and suggest an infection with the streptococcus involving the subserous layers.

In 1923 I studied the records of 230 cases of colitis and was struck with the large percentage of cases in which there was evidence of a coexisting cholecystitis. I called attention to the similarity in the pathologic process in colitis and cholecystitis, believing at that time that the two conditions were probably the results of hematogenous infection from a common focus. Since then I have observed patients with long histories of intestinal infection who later developed evidence of cholecystitis and gradually came to the conclusion that the cholecystitis was secondary to colitis. Clinically these cases of colitis varied in degree from spastic constipation, or so-called "irritable colon" to the very serious cases of ulcerative colitis. In all, however, definite inflammatory changes were demonstrated.

The following case is illustrative.

J. E. C., age 29, a thin, sick-looking man, with sallow complexion and flabby muscles. He gave a history of constipation from childhood, but for three or four years has had alternating attacks of constipation and diarrhea. Recently he has had three or four mushy stools daily, increased to a dysentery on indiscretion in diet. Has much abdominal pain with rumbling in bowels and expels much gas from the rectum.

About four years ago he began to have attacks of digestive disturbance, pain in the epigastrium, belching, vomiting and severe headaches. Attacks increased until they occurred about once a week or ten days. Weight dropped from 156 to 129 pounds and he felt absolutely miserable.

Examination showed a tenderness along a spastic colon, and local tenderness in the gallbladder region. Proctoscopic examination showed mucosa of the rectum and sigmoid thickened and inflamed, with areas of granulation which bled easily, and many superficial ulcers. There was a free discharge of blood-shot mucopus. With colon treatment he improved, but still had indigestion.

Operation was illuminating, showing one of the most marked cases of local hepatitis I have seen. There was an area as large as an outspread hand, contracted and cirrhotic, in the center of which was a moderately thickened gallbladder which was removed.

Since the operation he has been much improved, gained twelve pounds in two weeks, has no dyspeptic symptoms and very few headaches.

I report this case, as to my mind it illustrates a common sequence in these infections, a long period of low grade infection in the colon, leading to a secondary involvement of the liver and gallbladder. In this case the amount of hepatitis was extreme and out of proportion to what might be expected with a simple cholecystitis in a young man, and I believe this is explained by the constant flow of infection from the severe colitis. It also appears that the severe toxic symptoms, headaches and depression may have had some relation to the degree of hepatitis.

*Age sequence.* Average age in this series was thirty-seven, with a history of long standing trouble. This places the age of onset much earlier. Alvarez in his series found the average age at operation was forty-four years, but with a duration of complaint of nineteen years. This places the average age onset at about twenty-five years.

Gallbladder disease is more frequent in women, the proportion being about three to one, and is more common in those who have borne children.

The present study is based on 500 cases, in which a clinical diagnosis of cholecystitis has been made. In practically all of them special attention was given to the history of constipation, diarrhea, passing of mucus and blood, etc. Careful examination was made with the aid of the fluoroscope and also the sigmoidoscope for tenderness, spasticity or deformity of the colon. Mucus or mucopus was removed through the sigmoidoscope for study. These examinations have resulted in finding that a large proportion of cases of cholecystitis had (1) a history of preexisting or coincident abdominal disturbance that could be attributed to an abnormal colonic function, (2) abdominal tenderness and resistance could be demonstrated following the outline of the colon, (3) a sigmoidoscopic picture of chronic progressive inflammatory changes in the mucous membrane, (4) changes as shown by the roentgenogram from spasticity to loss of peristaltic action and contraction and deformity of the walls.

Sixty-nine per cent of these cases showed evidence of inflammatory changes in the colon. These findings, I believe, have warranted the conclusion that chronic inflammations in the colon are very common and are probably the most frequent cause of infections in the biliary system.

## PATHOLOGY

In considering the inflammatory pathology of the gallbladder, two types may be described.

1. Cholesterosis. This includes strawberry gallbladder and possibly those in which cholesterin stones are found, with very slight change in the wall of the gallbladder. The factors concerned in this condition are (a) catarrhal inflammation of the mucosa of the gallbladder, (b) stasis, (c) increased blood cholesterin which occurs in obesity, during pregnancy, menstruation and on high fat intake. Boyd, Stewart and Mentzer have shown that cholesterin is deposited in cells at the tips of villi which enlarge, and these cholesterin-laden polypi break off, forming nuclei of calculi.

2. Probably a more important type may be called mural cholecystitis. This chronic or recurring infection, carried by the lymphatics, involves the subserous layer of the gallbladder, producing a chronic inflammation with thickening of the wall. Exacerbation of the inflammation may produce an overlying local peritonitis with scarring and adhesions, and by lymphatic extension may involve the surrounding structures. It also may cause sufficient catarrhal inflammation to favor cholesterosis. The pathologic picture seen on the operating table suggests that infection is also carried by the lymphatics from the gallbladder to adjacent structures. We see marked local hepatitis with maximum changes close to the gallbladder, diminishing away from it. Inflammatory changes also are seen that radiate from the gallbladder over surrounding structures, also diminishing with distance.

## SYMPTOMS

The clinical manifestations of gallbladder infection are noted for wide variation in kind and degree. Characteristic is the fact that at the time of consultation they have existed for a period of years. Classification of symptoms is necessarily arbitrary and without definite lines, but for purposes of description, may be made as follows: (1) Symptoms from the biliary apparatus, (2) reflex symptoms, (3) those due to extension of pathology to other organs.

1. *Symptoms from the biliary apparatus.* Pain, whether sudden attacks of acute colic or periodic attacks of dull aching pain, becoming agonizing in the epigastrium, referred around the right side or passing through to the back or to the right shoulder. It is steady, increasing paroxysmally, resulting in pallor, sweating and extreme restlessness. There may be chills and fever.

Milder attacks of recurring subacute cholecystitis produce a dull aching pain in the right side, possibly referred to the right shoulder or back, with moderate soreness on pressure or deep breathing. There may be slight fever and mild jaundice. Such an attack may, with or without calculi, become severe with obtsruction of the cystic duct, resulting in a tender, swollen gallbladder, increasing fever and possibly chills and jaundice. This may shortly subside or result in sequelae, such as hydrops, empyema, gangrene or perforation of the gallbladder. Calculi in the cystic or common ducts may result in profound changes in the ducts, liver and blood, producing chills, fever and deep jaundice.

Acute inflammation with or without stones usually occurs in the course of a chronic cholecystitis. It results in local pain, tenderness and rigidity in the right subcostal region, with nausea, vomiting, elevation of temperature, leucocytosis and possibly jaundice.

Jaundice may result from obstruction of the main duct or from an associated cholangitis. Jaundice from obstruction may exist for a considerable time with fair health and activity. In two cases with stones, having deep jaundice for eighteen months or more, the patients did their daily work. However, there is usually poor appetite, nausea, loss of strength and weight, and an aggravating itching of the skin.

Hepatic insufficiency or cholemia may give serious symptoms. Moynihan discusses two types as follows: "There is one in which the amount of bile discharged ceases or is greatly reduced; jaundice deepens ominously; the mind becomes obtuse, vomiting develops, the pulse becomes slower, the patient more and more enfeebled; drowsiness precedes coma, and the blood urea steadily increases; renal failure, consecutive to hepatic failure, is then the cause of death. And there is another, in which after a normal course of three to eight days, the bile discharged becomes copious, thin, and pale; jaundice does not change perceptibly; restlessness, great prostration, profound muscular weakness, and a peevish irritability are noticed; vomiting is present, but is not as a rule severe; blood urea remains low; failure of the liver function is the cause of death."

Mann has, by removing the liver in dogs, produced similar symptoms, rapidly terminating in death. He has found that these symptoms were associated with a rapid fall of blood sugar, and intravenous glucose caused rapid improvement, the dogs eventually dying from other causes.

2. *Reflex symptoms.* The liver and biliary apparatus, stomach and duodenum are closely related embryologically, and retain a closely associated nerve control. Therefore, reflex symptoms from the stomach and duodenum are common.

The gastrointestinal symptoms, so-called dyspepsia of cholecystitis, are explained on the basis of reflex disturbance of the motor, but also of the secretory function of the stomach and duodenum. There is described a dull pain or discomfort in the epigastrium with a sense of fullness, bloating and marked tendency to belching. This usually appears very soon after a meal, in fact often before the meal is finished. Belching and eructation give relief. Nausea is common and may be prominent, the so-called biliousness. These symptoms, often mild and not usually very distressing, may have existed for years without having been investigated. They may date from an attack of influenza or tonsillitis. There is some tendency to periodicity but there is not the prolonged period of relief seen in ulcer. In fact, many patients have had this trouble daily for years, or if relatively free, it requires only some indiscretion in diet to produce a recurrence. Certain types of food, a raw apple, salad, greasy foods, highly seasoned food, or a large meal will increase the symptoms. There is no food relief; in fact, they are afraid to eat, and so long as they refrain from eating are comfortable.

Pylorospasm, or more properly gastrospasm, involving the pyloric end of the stomach, explains many of the symptoms, the sense of fullness and tension, the belching and eructations. The entrance of food into the stomach induces peristalsis which in these cases is irregular and abnormal, with a tendency to spasm of the pyloric muscle or the pyloric end of the stomach. If the spasm in the stomach is marked, it may produce a burning pain or even result in a severe colic.

Duodenal spasm is in some cases marked, resulting in nausea and vomiting. We have all seen postoperative vomiting after cholecystectomy immediately clear up on removing a drain which was irritating the duodenum.

A transient cardiospasm due to cholecystitis is not uncommon, though little referred to in the literature. During a period of gallbladder dyspepsia there develops, after a large meal or during the night, a severe substernal pain. It is constant, though rhythmically increased, referred up the neck or to the angle of the jaws. It gives the sensation of a bolus in the esophagus and there is an intense desire to bring it up. It is usually relieved by vomiting or by taking quantities of soda and water.

Cardiac reflex symptoms. With the sense of gastric tension there is often palpitation of the heart, perhaps with oppression and pain in the left side of the chest, dyspnea and irregularity. Actual myocardial damage results from chronic biliary tract infection.

3. *Symptoms due to extension of inflammation.* Duodenum and stomach. Certain cases of cholecystitis present a symptom-complex similar to that of peptic ulcer. This syndrome has been explained on a basis of pylorospasm. I believe, however, that insomuch as many cases with pylorospasm do not present this syndrome and in others there is not the time relation between pylorospasm as seen with the fluoroscope and the symptoms, we should seek further for the cause. In a number of cases presenting this ulcer syndrome I have observed at operation peritoneal reaction with red injected adhesions over the duodenum and pyloric end of the stomach. I believe this periduodenitis is responsible for this symptom-complex. I have also observed that in these particular cases cholecystectomy has not given satisfactory immediate results. Extension of infection, producing inflammatory adhesions over the hepatic flexure and down the right colon, is not uncommon, and is a cause of right sided soreness and pain.

## DIAGNOSIS

The diagnosis of certain cases of gallbladder disease is unquestionably difficult, and we turn with interest to the newer diagnostic methods. Study of the liver function, cholecystographic examination and blood chemistry reveal much useful information, but often a diagnosis will mainly depend on a systematic history taking and a careful physical examination. In taking a history we must keep in mind the fact that often the disease begins in early adult life, and that epidemics of colds, tonsillitis and influenza leave many cases of cholecystitis in their wake.

Tenderness in the gallbladder region is a most important finding. This is best elicited by inserting the tips of two fingers well up under the right costal margin and asking for a deep breath. At all times comparison is made with the opposite side. At times there is advantage in the sitting posture with the body slumped forward. With a tender colon it is necessary to examine with the aid of the fluoroscope and a visualized bowel.

*Jaundice.* The detection of jaundice is of great value in the diagnosis of cholecystitis. Determination of icterus index is valuable, not only in detecting latent jaundice but in determining its degree, increase or decrease. However, for general routine examination nature has provided a splendid colorimeter in the sclerae, and in all cases it should be carefully inspected in a good light. The van den Bergh reaction gives us valuable information as to the source of the bile pigment.

*Roentgenography.* The roentgenogram may show stones, an enlarged gallbladder, pressure defects in surrounding hollow visera or the effects of adhesions, but its value has been enormously increased by the work of Graham and Cole in developing their method of cholecystography. This test shows whether or not the cystic duct is patent and if so, shows the size, shape and position of the gallbladder, its motility, its ability to concentrate bile, and greatly increases the number of cases in which stones can be demonstrated.

## TREATMENT

The treatment of cholecystitis is generally considered to be surgical. In the acute cases, with threatened suppuration or gangrene; in the chronic cases with marked pathology in the gallbladder, liver and pancreas; and when there are stones in the common duct, all agree as to the necessity of surgical intervention. However, with earlier diagnoses in early stages of the disease in young people there is opportunity for deliberation.

I feel that in these cases the tonsils and other possible foci of infection should be cleared up, attention given to the diet and possible intestinal infection, and in not a few recovery may be looked for. I have practically given up Lyon's duodenal drainage. I learned, however, that with the tube in place drinking hot water on an empty stomach soon brought forth an abundant flow of bile. Therefore, I advise my patients to take freely of hot water on rising and several times a day, distant from meals.

The diet should be in the form that passes through the stomach with the least amount of disturbance, that is, liquids and soft, bland food. Theoretically natural oils, such as olive oil, butter, etc. encourage emptying of the gallbladder. Hurst recommends urotropin up to 300 grains daily.

Surgical treatment has received so much attention lately that I will not spend time in describing surgical technic. Unless there are contraindications, cholecystectomy is the operation of choice. I have been closing without drainage about 75 per cent of my cases and certainly they have less postoperative nausea and discomfort.

In this series 85 received surgical treatment. In most of them a cholecystectomy and appendectomy were done for chronic trouble. There were five cases of perforation of the gallbladder and one of gangrene and perforation of the cystic duct. Often in acutely distended gallbladders, with or without perforation, a cholecystectomy can be done easily and the area freely drained.

In the case of perforation of the cystic duct in a woman of 63, there were two stones in the duct, an opening and free stones and pus outside. The gallbladder was removed and the stump of the duct ligated.

In serious cases with jaundice, cholemia or impaired kidney function, Walter's method of preparation is used. It consists of (1) daily intravenous injections of calcium chloride (or if that fails, a blood transfusion) to reduce the coagulation time of the blood, (2) forced carbohydrates to maintain glycogen store in the liver, (3) free fluids. Its value has been so great that operation on deeply jaundiced cases formerly having a high mortality is now relatively safe.

In one case I saw a woman of 74 with a stone in the common duct, jaundice and symptoms of cholangitis, such as repeated chills and fever over a period of three months. Her age, jaundice, and particularly the signs of infection made her case a very serious one. However, by using the above methods, her blood coagulation time was brought down from twelve to five minutes. The stone was removed from the common duct and she made a good recovery.

Another woman of 63 was seen, with intense jaundice which had been present for about one and one-half years, with many petechial spots on the body. During this time she had lost about sixty pounds in weight. There was a large, hard, irregular mass in the right side of the abdomen, going down almost to McBirney's point. This case had been considered to be malignant, but an analysis of her history showed that she had frequent improvement in her color.

On the basis of the history, a diagnosis of stone in the common duct was made. Her coagulation time was eleven minutes and she had marked secondary anemia. After preparation according to Walter's method, an operation largely under local anesthesia was done. The liver was enormously enlarged, cirrhotic and greenish yellow. The gallducts were greatly dilated but no stone could be felt in them. The common bile duct was freed down to its entrance into the duodenum by mobilizing the duodenum, but the mass could not be reached without great danger to the bile duct. Therefore, the transduodenal approach was made to the pancreas which was incised and the stone palpated, but it was not easily enucleated. With a forceps it was pushed up until it could be removed through the common bile duct. Her recovery was uneventful and she is now entirely well.

There were four cases of acute hemorrhagic pancreatitis, one following a cholecystectomy. In all gallstones were present. The stones were removed, the gallbladder drained, and the pancreas incised and drained. All recovered.

In this series of cases there was one death.

A woman of 78, moderately jaundiced, for some years had had very much upper abdominal pain and frequent attacks of chills and fever. Operation showed enormously dilated bile ducts. The common duct was packed full of stones down to the opening of the duodenum. Both the hepatic ducts were greatly dilated and full of stones. Stones were removed and drainage of the duct instituted. The second day she developed lobar pneumonia, from which in the course of a few weeks she had recovered, but a week later, while sitting up, suddenly dropped back dead.

These cases illustrate the marked advantage of applying methods that have developed from studying the physiology of the liver, gallbladder and other related organs.

## CONCLUSIONS

1. Cholecystitis is the most frequent cause of chronic dyspepsia.

2. Infection of the gallbladder is usually associated with infection in the adjacent liver and often of the pancreas, duodenum and other organs.

3. These infections may be hematogenous from some distant focus, but are usuaully secondary to an infection in the gastrointestinal tract, carried through the portal circulation to the liver and thence by the lymphatics.

4. Chronic colitis is a common condition, and a most important factor in the development of cholecystitis.

5. Newer methods of examination are of great value, but should not displace intensive clinical study.

6. Proper surgical treatment is based on knowledge of the physiology of the liver and associated organs.

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Significance of Renal Counterbalance in Surgical Treatment of Renal Lesions. Frank Hinman, San Francisco (*Journal A. M. A.*, April 19, 1930), says that in every borderline case of unilateral hydronephrosis—not much parenchyma, low function, little if any improvement with a retention catheter, and possibly chronic infection—the kidney should be removed without any attempt at repair, provided the opposite kidney is healthy and hypertrophic. On the other hand, in bilateral abnormality every possible attempt to preserve a kidney with the same or even much greater degree of injury should be made. The facts of the experimental study of repair hydronephrosis point quite clearly to this conclusion. It makes little difference what theoretical interpretation one cares to make of them. The question of disuse atrophy is purely hypothetical and, whether accepted or not, does not alter in any way the practical application of the facts. The renal alterations will vary with variations in the factors controlling the injury and the repair. The changes are passive. Secretory units have no volition in the matter. There is no active competition in the sense that the right and left sides are trying to drive each other out of business. The injury causes renal atrophy with loss of function. If extensive, the remaining renal mass hypertrophies because of the extra work. If the injury is removed, repair will occur, broadly speaking, in proportion to the extent of the injury and the demand for repair. An early hydronephrosis has good possibilities and with removal of its cause of obstruction is given continuous, gradually increasing stimulation that produces permanent repair. The readjustment is cooperative. If injury, such as infection or partial obstruction because of unsuccessful surgery, persists, the repair is not permanent and the readjustment becomes competitive and a gradual atrophy may result. A late hydronephrosis has poor possibilities of repair and is not given an opportunity to make the most of them because of little or no increase of stimulation. The readjustment from the start is competitive and a gradual atrophy the result. The term renal counterbalance covers sufficiently enough the conception of alterations of the renal mass of the two kidneys from hypertrophy and atrophy as the result of injury and repair. It seems more fit than renal compensation. The two types of readjustment may be termed cooperative and competitive, even and uneven, or proportional and disproportional counterbalance, the whole idea being that in a cooperative type the secretory units of the two kidneys respond more or less equally to the same stimulation and the ability of continued response on the injured side remains because the injury has been removed, even though it may have only 10 secretory units to its fellow's million. In a competitive type the response of each individual unit on the repair side is slower and weaker than on the healthy side. The smaller number of units function inefficiently for some time because the injury persists or full repair has not occurred in those secretory units remaining that are susceptible of repair. The relative number of secretory units of the two sides has nothing whatever to do with the counterbalance. Similar readjustments occur in the substance of a single kidney with or after removal of localized injury. An infantile kidney with so few units that it could not carry on total function does not atrophy. It has undergone a cooperative type of adjustment with its big, capable mate.

PREVENTION OF DEFORMITIES IN CHRONIC ARTHRITIS. Loring T. Swaim and John G. Kuhns, Boston (*Journal A.M.A.*, April 12, 1930), assert that when spinal arthritis has been found or is strongly suspected, the most effective measure for preventing deformities is rest in correct positions. This means complete rest in bed, for a matter of weeks. Any extensive experience with this disease makes it evident that no patient can become cured of the malady and continue at his work at the same time. Recumbency is indicated to afford rest to the patient, to give an opportunity to raise his resistance, to allay pain and muscle spasm and, above all, to prevent the forward deformity. This recumbent rest must be so arranged that positions are not assumed which induce the spinal and thoracic deformity described. The patient's bed should not sag in the middle; there should be but one small pillow under the head; often no pillow is better. It is less fatiguing and less likely to cause deformity to have the patient sit in a straight-backed chair than to have him bolstered up in bed with its certain flexion of the dorsal spine. At intervals of about one-half hour several times during the day a pillow should be placed upder the dorsal spine and the hands should be placed under the head. This pulls the thoracic cage into the fullest possible expansion. When deformity has already occurred, complete recumbency for a period of weeks is required. Heat aplied to the spine in any form gives comfort and decreases muscle spasm. The patient is placed in a hyperextended position at short intervals during the day to mobilize the spine, to increase chest expansion and later to correct deformity. The patient is first taught to lie with a pillow under the knees to flatten the lumbar spine. No pillow is permitted under the head at these times, thus making for full extension of the cervical and dorsal spine. When this becomes comfortable, a pillow is placed under the back at the apex of the bowing for short periods; later this may be replaced by a sand bag or half shell plaster cast, in which the patient may lie for short periods or even all night. A more vigorous measure is to have the patient lie on a firm hair mattress, which is gradually raised by means of inch boards placed from day to day under the apex of the deforming spinal curve. Not all deformities yield readily to such treatment but all will improve to an encouraging degree; sometimes, however, only after months of persistent treatment. When such therapy cannot be followed and stiffness increases, the spine should be allowed to ankylose only in the best functional position: with the chest in full expansion and the spine in full extension with no increase in the normal curves. Exercises play an important part in the treatment of spinal arthritis. These are given several times daily in the recumbent position. As the patient becomes more comfortable and stronger, he is given sitting or standing exercises. They should be designed to mobilize the stiffened spine, to improve chest expansion, and to strengthen the atonic abdominal wall and the weakened spinal muscles. These exercises should be continued until the patient is well. With the disappearance of muscle spasm and improvement in spinal and abdominal musculature, the patient should be provided with apparatus which will help prevent deformity and yet not restrict the chest. Torticollis, a rotation of the head due to cervical arthritis, is one of the most unsightly as well as obstinate deformities that involve the head. When the head is pulled to one side by the protective muscle spasm, it should be put at complete rest with the neck in the normal erect position and the face looking straight forward. This position should be held by a posterior plaster shell or sand bags. Heat applied to the back of the neck and traction from 3 to 10 pounds (1.4 to 4.5 Kg) on a head sling often help relieve the muscle spasm. As the muscle spasm decreases, the position of the head should be permitted to become stiff only in a good position, with the head facing directly forward and balanced well on the torso for the upright position. Involvement of the temporomandibular joints occurs in a large number of arthritic cases. A certain amount of correction can be secured by the use of soft wood wedges between the upper and lower teeth. Various operative procedures have been devised for securing motion when the joint is ankylosed.

CRITICAL TREATMENT PROBLEMS IN TODAY'S SYPHILOLOGY. John H. Stokes, Philadelphia (*Journal A.M.A.*, April 5, 1930), discusses recent developments in the control of infectiousness by organized and socialized treatment, which is, in essence, the management of early syphilis; the problem of bismuth; the prevention and control of the two most threatening aspects of late syphilis, disease of the heart and of the nervous system; and smoother treatment. He says physicians should encourage and use the university clinic, the medical school and hospital and public health clinic; take more time to explain to the patient with syphilis what they are about, for an intelligent talk makes for cooperation, confidence and friendliness, and these are as important as drugs in cure; read and keep up to date, drawing syphilotherapy from the journals and the schools, and not from hearsay and the pharmeutical man; accept and put in practice in the management of early syphilis the fruits of the past decade's best controlled investigations. About the problem of bismuth he says: Select two or three good bismuth preparations and learn to give them without disturbing the patient. Then let the rest go by, for five years, until an authoritative summary appears in the literature. Practically all the work that a bismuth preparation can do for the average man today can be done with the fat-suspended potassium bismuth tartrate, the salicylate or, if one considers European practice, the glucose-suspended hydroxide or metallic bismuth. One who wishes to see what tryparsamide can do must use it continuously, not in broken courses, in the individual case for not less than two years, before expecting to find the serologic reversal of blood and fluid reactions on which so much stress is laid. The combination of tryparsamide and of a nonspecific fever induced by typhoid-paratyphoid vaccine, whose possibilities have barely been touched, is a direction in which important advances can take place. He concludes by saying: We can smooth the road of treatment by an irreproachable technic in the use of the agents we have available, and in a thorough application of the known principles governing their action and reaction in the patient. Where do we of the rank and file meet our difficulties in the treatment of the patient with syphilis? 1. We do not examine the patient adequately before we fire the first shot. 2. We too often fail to envisage an aim, a purpose for which we are treating, in part because we have not appraised the case adequately. 3. The practitioner systematically forgets, or has never understood, the Herxheimer reaction, or therapeutic shock. A third of his troubles come from this source. 4. We forget too easily the double-edged effect of rapid healing produced in a syphlitic lesion by an arsphenamine. 5. The therapeutist too often does not know his drugs and their complications. 6. We overlook too easily the niceties of technic. Hurting the patient in any therapeutic procedure is, in cumulative effect, a serious matter.

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ARTERIAL EMOLISM AND EMBOLECTOMY. In six cases of arterial embolism of the extremities reported on by Jacob Lerman, F. R. Miller and C. C. Lund, Boston (*Journal A.M.A.*, April 12, 1930), the embolus was located in the axillary artery in one case, in the brachial artery at the profunda branch in one, at the bifurcation of the brachial artery in one, in the femoral artery at the profunda branch in two, in one of which both femoral arteries were obstructed, and at the bifurcation of the aorta in one. In four cases cardiovascular disease was the underlying cause of the thrombus and in one an aneurysm of the subclavian artery; in one the cause was not definitely established. The result from embolectomy in two cases was good so far as the circulation of the affected extremity was concerned. One of these patients, however, died thirteen weeks after operation as a result of myocardial disease. The other three patients operated on died from one to five days after embolectomy, in spite of postoperative improvement in the circulation of the extremities involved. They conclude from their observations that the success of embolectomy depends on various factors, particularly on the time elapsing from the onset of symptoms to operation and on the location of the embolus. Narcotics may mask the symptoms in embolism of the extremities, thus jeopardizing the chances for early operative treatment.

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# EDITORIAL

## THE NATURE OF OBESITY

The opinion has prevailed among large numbers of the medical profession and has been quite general with laymen that people become fat because they eat too much and exercise too little, or on account of some constitutional abnormality or endocrine perversity. Newburgh and Johnston[1] have made an exhaustive study of the subject of obesity and believe that the cause can be ascribed exclusively to dietary errors or excesses. The belief that obesity is of endogenous origin, due to a lessened specific dynamic response to food or a constitutional anomaly of cells which lowers intracellular oxidations, is rejected by these investigators. Many persons of normal stature show abnormally low metabolic rates. Those who attribute endogenous obesity to a lessened specific response to food often note forms of pituitary disease characterized by small increase of metabolic rate due to food but without adiposity. The well known fall in basal metabolic rate caused by undernutrition in a normal subject often fails to occur in cases of obesity.

It seems a remarkable fact that obese persons frequently fail to lose weight for a number of days when they are undernourished and may actually increase in weight. Formerly when a subject utilized a diet containing less energy than he was thought to be using, his extra calories were assumed to arise from the oxidation of body fat, and the number of grams of fat required to make up the deficit formed a basis for predicting the amount of weight to be lost. It has long been known that there is a constant exhalation of invisible material from the body. It has been determined that there is a quantitative relationship between the amount of weight lost by this insensible perspiration and the metabolic rate. This loss is estimated by weighing the subject at the beginning and end of a twenty-four hour period. If to the first weight is added that of food and drink for twenty-four hours, and to the second weight that of the urine and stool for the same period, the difference between the first and second sums is the insensible loss for this period. From this the loss of weight per hour is obtained, and from it is estimated the total loss of calories for this period. An interesting observation followed the application of these principles to a normal person who received a deficiency diet and whose losses of weight and calories were obtained by this procedure. It was found that he gained weight for five days before he actually began to lose, in spite of taking in less energy than he used. This phenomenon was identical with that of the obese person under similar conditions.

The ability of an individual to maintain weight, when conditions are such that a loss of adipose tissue is expected, has been interpreted by some as evidence in such a person of a special type of metabolism which fails to obey the law of conservation of energy. If the same conditions continue, however, it will be observed after a few more days that an abrupt downward inclination in the weight curve has taken place. The individual is now losing weight much more rapidly than can be accounted for by destruction of body tissue. This loss of weight continues until the total loss calculated from the beginning equals the predicted loss due to the oxidation of body tissue.

Another factor to be considered in reduction of weight is that of water exchange in obese persons. On the one hand is the physically free water which must be dealt with by the organism, called "the available water," and on the other hand the water loss from the body during this period. The available water consists of that which is drunk, the water content of the food, that made by oxidizing the hydrogen of the metabolic mixture and that preformed water held by body tissues and released when they are destroyed to supply energy. Water leaving the body includes that of the urine, of the stool and that lost insensibly from lungs and skin, which can be determined by certain calculations. From these studies the authors have determined that body weight is the result of two processes. There may be either an addition to or a loss from the body of solid material, or there may be a result due to retained or loss of water. Departures from the predicted weight may commonly be accounted for by storage or loss of water.

The authors conclude that obesity is always caused by an inflow of energy that is greater than the outflow. It is never the direct result of abnormal metabolism but is always due to food habits not adjusted to the metabolic requirements. There are two groups of obese persons. In the first, laying on of fat is the result of perverted habit. Normally the individual possesses a mechanism that notifies him when he has eaten enough. If he succeeds in dulling the sensation concerned by disregarding nature's warning and from following the example of his elders who overeat, or as a result of weak will and the urge of gastronomic pleasure, the background is laid for the condition of obesity. The second group includes persons who by previous experience have learned the right amount of food for their requirements. The lessened outflow of energy leads to obesity, due to lessened activity, from advancing years, change of occupation and the like.

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[1] Newburgh, L. H. and Johnston, M. W.: The Nature of Obesity. Jour. Clin. Invest., Vol. VIII, No. 2, 197, Feb., 1930.

A warning against the promiscuous use of obesity remedies and fat reducing cures has been announced by Cullen[2] of the U. S. Department of Agriculture, as being worthless or dangerous. He says that no other class of medication exploited to humbug the people has a wider sale than these so-called fat remedies. The accompanying loss of weight is attributed to the hot baths, diet and exercises recommended with the medication. These preparations frequently contain thyroid extracts, which have produced serious and often fatal results, being taken without medical supervision. Some contain phytolacca, a poisonous drug having no possible effect in reducing flesh.

These observations concerning the nature of obesity seem to be logical and appeal to the keen observer as a rational explanation of this much discussed problem. If accepted, they suggest methods of treatment at variance with some procedures which are often followed.

## PACIFIC NORTHWEST MEDICAL ASSOCIATION

The annual meeting of Pacific Northwest Medical Association was not held last year on account of the American Medical Association being scheduled at Portland. The Pacific Northwest meeting is the outstanding medical gathering of the Northwest and is one which should be attended by every medical man and woman who can arrange to do so. Aside from the great national organization no medical institution has assembled in this section of the country such groups of eminent and distinguished members of our profession.

Plans for the eighth annual meeting in Butte, Mont., July 1-3, Tuesday, Wednesday and Thursday, are advancing toward completion. There will be three daily sessions, morning, afternoon and evening, with a smoker following the Tuesday evening meeting and a banquet substituted for that of Wednesday evening. The Butte committee is doing everything possible to assure a large attendance from their state and it is hoped that the rest of the territory will furnish an unusually good attendance because of the excellence of the program.

The following is the program so far as it has been completed to date.

*Dr. Edwin I. Bartlett,* Associate Professor of Surgery, University of California Medical School; a pupil of Dr. J. C. Bloodgood.

Titles:

1. Surgical Pathology of Carcinoma of the Breast.
2. The Technic of Breast Operations.
3. Operative Conditions of the Neck with Technic of Neck Dissection.

*Dr. Hilding Berglund,* Professor of Medicine, University of Minnesota Medical School; Erstwhile Exchange Professor of Medicine at Pekin Medical School.

Titles:

1. The Anemias and Their Therapeutic Possibilities.
2. The Value of Gastric Analysis and a Discussion of the Causes of Epigastric Distress.
3. The Therapeutic Possibilities and Responsibilities in the Various Types of Bright's Disease.

*Dr. Harold Brunn,* Associate Professor of Surgery, University of California Medical School.

Titles:

1. Atelectasis of the Lung.
2. Atelectasis of the Lung.
3. Cancer of the Lung.

*Dr. A. J. Carlson,* Professor of Physiology, University of Chicago Medical School.

Titles:

1. The Involuntary Nervous System and Circulation.
2. The Involuntary Nervous System and Digestion.
3. The Involuntary Nervous System and Metabolism.

*Dr. George B. Eusterman,* Head of Gastroenterological Section at Mayo Clinic.

Titles:

1. Unusual Lesions of the Stomach and Duodenum with Differential Diagnosis.
2. The Significance of Gastric Anacidity in General Medicine and Gastroenterology.
3. The Results of a Follow-up of Cases of Chronic Duodenal Ulcer on Ambulant Medical Treatment.

*Dr. Emile Holman,* Professor of Surgery, Stanford University Medical School.

Titles:

1. Pulmonary Suppurations. Important Factors in Its Development and Its Repair. A Clinical and Experimental Study.
2. The Surgical Treatment of Pulmonary Suppurations. Postoperative Pulmonary Abscess, Chronic Bronchial Fistula and Pulmonary Tuberculosis.
3. The Treatment of Burns from Inception to Complete Epithelialization.

*Dr. Allen K. Krause,* President and Director of The Desert Sanatorium and Institute of Research, Tucson, Arizona.

Titles:

1. Some Aspects of Chronic Pulmonary Infections.
2. Physiologic Relations in Tuberculosis.
3. The Question of Activity in Tuberculosis.

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[2] Cullen, F. J.: Food, Drug and Insecticide Administration, U. S. Department of Agriculture, April 24, 1930.

*Dr. Chauncey D. Leake,* Professor of Pharmacology, University of California Medical School.

Titles:

1. Recent Advances in Anesthetics and Drugs Used to Depress the Central Nervous System.
2. Recent Advances in the Pharmacology of the Autonomic Nervous System with Special Reference to Circulation.
3. Recent Advances in Chemotherapy.

*Dr. Andrew Stewart Lobingier,* Surgeon, Merritt Building, Los Angeles, California.

Titles:

1. The Necrotic Edema of the Gallbladder.
2. The Pathogenesis of Pancreatic Disease.

*Dr. T. M. Rivers,* research worker in The Rockefeller Institute for Medical Research.

Titles:

1. Spontaneous Generation in Relation to the Nature of Viruses.
2. The Problems Concerning Chickenpox, Measles and Poliomyelitis.
3. Viruses in Relation to Tumors. Infectious Myxomatosis of Rabbits (Sanarelli).

*Dr. Meyer Wiener,* Professor of Ophthalmology, Washington University Medical School, St. Louis, Missouri.

Titles:

1. Intraocular Operations.
2. Care of Injuries of the Eye.
3. Plastic and Cosmetic Surgery of the Eye.

The Pacific Northwest Medical Association has arranged a visit to Yellowstone National Park for the members of the Association, leaving Butte on any train of July 3 or 4. There will be a rodeo at Livingston on July 4. The trip through the park will extend from the fourth to the eighth. For complete information regarding the expense and train time address Dr. E. G. Balsam, secretary of the Montana Medical Association, box 88, Billings, Mont.

The membership fee of $15.00 is now payable to Dr. Frederick Epplen, secretary and treasurer, 639 Stimson Building, Seattle, Washington.

## THE IDAHO ANNUAL MEETING

Idaho State Medical Association will hold its annual meeting at Coeur d'Alene June 27-28. The sessions will probably be held at Bozanta Tavern at Hayden Lake, a short distance from the city. Hotel accommodations can be reserved either at the lake or in the city as one desires.

The committee plans a boat ride on Lake Coeur d'Alene Friday evening, with luncheon at the new Boy Scout camp, which is said to be especially attractive. Saturday evening the annual banquet will be held at Hayden Lake. The Woman's Auxiliary will also hold its annual meeting at this time. Entertainment for the visiting ladies will be provided by the Auxiliary, which will assure pleasing attractions for the visitors.

The following week the annual meeting of the Pacific Northwest Medical Association will be held in Butte, preceded by the annual meeting of the Montana association which is scheduled for Monday. If one so desires, it will be a favorable opportunity for members from Washington and Oregon to visit these annual state meetings while on the way to the large meeting in Butte.

The program follows as completed to date. Next month the complete program will be presented.

*William J. Kerr,* University of California.

Titles:

1. Recent Additions to Our Knowledge of the Functions of the Liver.
2. Treatment of Cardiac Irregularities.

*E. J. Barnett,* Spokane. Recent Advances in Infant Feeding.

*D. C. Ray,* Pocatello. Resume of One Hundred Maternity Cases, Pocatello General Hospital.

*Carl Davis,* Milwaukee, Wis., will present obstetric films.

Papers will also be presented by Herbert W. Hill, London, Can., J. Tate Mason, Seattle, Wash., R. B. Dillehunt, Portland, Ore., and T. A. Ellison, St. Anthony, Ida.

## GOITER ASSOCIATION MEETING

The American Association for Study of Goiter will hold its annual meeting in Seattle July 10-11. This will be followed by a session at Tacoma July 12, with a trip to Mount Rainier. Since all practitioners are more or less associated with goiter cases and are interested in the treatment of this condition, the following program of papers will prove attractive, which are scheduled for this meeting.

### PROGRAM

1. E. R. Arn, Dayton, O., President's address: "Auricular Fibrillation Associated with Hyperthyroidism."
2. Willard Batlett, Jr., St. Louis, Mo.: Subject not yet announced.
3. Leo P. Bell, Woodland, Calif.: "Tumors of the Neck Simulating Goiter."
4. Addison G. Brenizer, Charlotte, N. C.: "Hyperthyroidism and Hypothyroidism Following 7,500 Thyroidectomies."
5. Harold Brunn, San Francisco, Calif.: "Why General Anesthesia Should Not be Used in Thyroid Surgery."
6. Thomas O. Burger, San Diego, Calif.: "Local Anesthesia with Adjuncts for Thyroidectomy."
7. Warren H. Cole, St. Louis, Mo.: "Experimental Study on the Production of Hyperplasia of the Thyroid by Chemical Means."
8. J. Earle Else, Portland, Ore.: Subject not yet announced.
9. William Engelbach, Santa Barabara, Calif.: "Simpler Diagnostic Methods of Endocrine Disorders."
10. Gordon S. Fahrni, Winnipeg, Man.: "Effects of Thyroidectomy upon Pregnancy."
11. N. W. Gillette, Toledo, O.: "Complications Following Thyroidectomy."
12. Allen Graham, Cleveland, O.: "End-Results of Malignant Goiter."
13. Samuel F. Haines, Rochester, Minn.: Subject not yet announced.
14. John S. Helms, Tampa, Fla.: "The Incidence of Goiter in the Southeastern States and Its Possible Significance."
15. Lewis M. Hurxthal, Boston, Mass.: "The Cardiovascular System in Goiter."
16. Arnold Jackson, Madison, Wis.: "Diagnostic Clinic."

17. Thomas M. Joyce, Portland, Ore.: "The Preparation of Thyroid Patients for Surgery."
18. E. Starr Judd, Rochester, Minn.: "The Treatment of Peptic Ulcer and Gallbladder Disease Complicated by Hyperthyroidism."
19. Wm. J. Kerr, San Francisco, Calif.: "Necrosis of the Heart and Liver in Thyrotoxicosis."
20. O. P. Kimball, Cleveland, O.: "The Relation of Endemic Goiter to Mental Efficiency."
21. Le Roy Long, Oklahoma City: "Hyperthyroidism."
22. E. P. McCullagh, Cleveland, O.: "The Relation of Carbohydrates to the Calcium and Phosphorous Metabolism in Tetany."
23. K. F. Meyer, San Francisco, Calif.: Subject not yet announced.
24. Raymond J. Millzner, San Francisco, Calif.: "Thyroiditis."
25. Henry F. Plummer, Rochester, Minn.: "Thyroid Therapy and Diagnostic Clinic."
26. H. W. Riggs, Vancouver, B. C.: Subject not yet announced.
27. C. A. Roeder, Omaha, Neb.: "The Third Type of Toxic Thyroidism."
28. Linden Seed, Chicago, Ill.: "The Differential Diagnosis of Thyrotoxicosis and Neurosis."
29. J. R. E. Sievers, Butte, Mont.: "Influences Bearing upon End-Results in Goiter Treatment."
30. E. P. Sloan, Bloomington, Ill.: "Anatomy of the Thyroid Region."
31. Martin B. Tinker, Ithaca, N. Y.: "Thyroiditis."
32. Robertson Ward, San Francisco, Calif.; "Carcinoma of the Thyroid."
33. Clarence G. Toland and John M. Askey, Los Angeles, Calif.: "Blood Pressure and Goiter. A Preoperative and Postoperative Study."
34. Ralph R. Wilson, Kansas City, Mo.: "Effects of Thyroid Activity upon the Female Organism."

## THIS SURGICAL ISSUE

In recent years an issue of this journal has from time to time been devoted to the publication of papers by members of the Seattle Surgical Society. This organization includes a group of representative surgeons of that city, whose members are active in promoting the science and practice of surgery. This collection of papers is indicative of the work of its membership, and it is hoped they will prove of interest to those who read them.

The custom of grouping results of the labors of different individuals, engaged in similar lines of endeavor, has become quite the vogue of late, thus producing greater emphasis on the minds of readers. Also some publications consider it desirable to identify definite issues with contributors from a certain localized area. While these procedures would doubtless be objectionable for routine practice with a journal of our character, yet it is believed an occasional issue along these lines may be advantageous by stimulating added interest on the part both of contributors and readers.

## MEDICAL NOTES

### OREGON

CANCER CURE INVESTIGATED. Dr. Richard B. Dillehunt, dean of the University of Oregon Medical School, Portland, made public announcement, April 18, of a report by Dr. Frank Menne, professor of pathology at the medical school, regarding the Coffey-Humber cancer cure. The report, which followed an exhaustive pathologic and clinical study of patients who had received adrenal gland extract, states there is so far insufficient evidence on which to base a claim that the progress of cancer is retarded by its use.

CLINIC CONTRACT LET. Contract for the construction of the new $400,000 clinic building at the University of Oregon Medical School at Portland was awarded early in April. It is expected that the new structure will be ready for occupancy next January.

PATHOLOGIST HONORED. A joint luncheon and meeting of the Portland City and County Medical Society and the Oregon Sociay Hygiene Society was held at the Multnomah hotel April 8 as part of the nation-wide observance of the birthday of Dr. William Henry Welch, dean of American pathologists.

FLIGHT SURGEON APPOINTED. Following a three months course at the army service school for surgeons at San Antonio, Texas, Dr. Cecil Ross, Portland police surgeon, has returned to his duties. He has been appointed official flight surgeon for Oregon.

HARVARD MEDICAL SCHOOL ALUMNI ASSOCIATION of the Oregon Commonwealth held its annual meeting and dinner at the University Club April 14. Dr. Robert H. Ellis is president and Dr. Wayne J. Stater, secretary-treasurer.

MEDICAL MISSIONARY IS VISITOR. Sir William James Wanless, retired medical missionary of Miraj, India, was a recent visitor in Portland, Corvallis and Pendleton, where he spoke in the interests of the Board of Foreign Missions of the Presbyterian church.

DR. MABEL M. AKIN, Portland physician, sailed from New York April 30. She will attend the quinquennial convention of the International Council of Women at Vienna May 27-June 9. Following this she intends to visit several European countries.

JACKSON COUNTY MEDICAL SOCIETY held its regular bimonthly meeting at the Hotel Medford in Medford, April 16. The society went on record as favoring an intensive campaign to eradicate diphtheria from Jackson County. To this end they propose to immunize by toxin-antitoxin, free of charge, all children brought to them during the thirty days following April 21.

MEDICAL BUILDING UNDER CONSTRUCTION. Work was expected to begin this month on the new twelve story Medical Arts Building at Eugene.

DR. H. J. KAVENAUGH of Portland sailed from New York April 23 bound for Europe, where he will spend several months in postgraduate work in obstetrics and pediatrics.

DR. C. E. JENKINS of the Rogue River Sanatorium has opened an office in Klamath Falls, where he will visit on certain days of the week.

Dr. M. S. Kern of Pendleton is now in Vienna, engaged in postgraduate study.

## WASHINGTON

Children's Department Planned. Sacred Heart Hospital at Spokane is to have a complete pediatric department. The entire fourth floor annex is now being remodeled for that purpose. Space will be provided for thirty-five children's beds, a sun room, playing room and nursery.

Cancer Clinic Planned. At a recent meeting of volunteer workers who are endeavoring to raise $1,150,000 to finance the new Seattle General Hospital, Dr. Park Weed Willis announced that the proposed institution will include a modern department for the treatment and investigation of cancer.

Inspects Hospitals. Dr. Willis H. Corson, superintendent of the King County Hospital, Seattle, left April 3 for an inspection tour of similar Eastern institutions. The board of county commissioners have authorized him to make a study of hospital management with a view toward incorporating the latest improvements in the new Harborview Hospital, now under construction.

Island Hospital Proposed. Private interests are laying plans for the erection of a modern hospital on Whidby Island. At present, injured and sick persons in the island towns must be taken to the mainland for hospitalization.

County Hospital Assured. The county commissioners of Kitsap County at a meeting early in April employed Mr. Chris Olson, a Bremerton contractor, to proceed with the erection of the new county hospital at Port Orchard.

Health Education Campaign. Pierce County Medical Society has entered upon a campaign to interest the community in preventive medicine. Space has been reserved in several Tacoma newspapers for advertisement articles, dealing with public health matters in their relation to the patient and his physician.

Health Officer Appointed. Dr. H. S. McGinness has been appointed to act as county physician of Yakima County during the absence of Dr. Lloyd Moffitt, who has been temporarily released on account of illness.

County Physician Named. Dr. H. L. Eldridge of Snohomish has been appointed County Physician of Snohomish County to succeed Dr. H. M. Berge of Everett, who resigned to engage in private practice.

Medical Missionary is Visitor. Sir William James Wanless, missionary-surgeon of Miraj, India, was a visitor in Aberdeen April 3, where he was entertained by local physicians. He gave an address on the subject of diseases of the eye, ear, nose and throat.

Dr. W. R. F. Luke of Spokane sailed last month for Europe, where he will engage in postgraduate study in Vienna and Budapest. He intends later to go to India for additional courses. Dr. J. L. Walter, formerly of Chicago, Ill., is taking over his practice during his absence.

Dr. R. H. Somers of Seattle, accompanied by his wife, sailed in April for Europe, where he will spend several months in postgraduate work in pediatrics.

Dr. Paul G. Flothow, accompanied by his wife, sailed April 2 from Seattle for Sidney, Australia, where he will take a ten weeks course in neurologic surgery.

Dr. Arthur N. Wilson, who has been engaged in practice at Port Ludlow, sailed last month from Seattle for Alaska, where he will assume charge of the Kennecott Copper Corporation hospital at Latouche.

Dr. C. S. Berry, formerly of Raymond, has moved to Tacoma where he will be associated with the Western Hospital and Clinic association.

Dr. H. A. Barner has taken over the offices of Dr. E. J. Taggart of Bremerton, during the absence from practice of the latter. Dr. Taggart is convalescing from a prolonged illness.

Dr. D. V. Ogievsky, formerly resident physician at the King County hospital in Seattle, has become associated with Dr. L. S. Dewey in the management of the Omak hospital.

Dr. Edwin Smith was a recent visitor to Auburn where he formerly practiced. He is now located at a settlement forty miles north of Nome. Last March he was rushed by airplane to Seattle for an operation, from which he is now convalescing.

Dr. A. J. Johnson has become associated with Dr. A. E. Bird in his practice at Camas. Dr. Johnson was formerly connected with the Mayo Clinic, Rochester, Minn.

Dr. William H. Lee of Seattle is acting at Bremerton as locum tenens for Dr. H. A. Barner, while the latter is absent from the city.

Thurston-Mason Counties Medical Society held a meeting at the Shelton Hotel March 20. Twenty-two members were present. Drs. Homer D. Dudley and Alexander B. Hepler, both of Seattle, were guests of the society and delivered addresses.

Whatcom County Medical Society held a meeting at the State Street assembly room in Bellingham March 31. The principal address of the evening was delivered by Arthur Heinemann of the Heinemann Diagnostic Laboratories, who spoke on "Food Allergy." Drs. John McGregor of Bellingham and H. M. Moss of Everson were elected to membership.

Yakima County Medical Society met in Yakima March 19. Dr. John H. Harter of Seattle gave an illustrated lecture on plastic surgery of the nose and face, while Dr. George Price, also of Seattle, talked on a neurologic subject.

Snohomish County Medical Society met in the library of the Medical-Dental Building in Everett April 1. A symposium on cardiorenal diseases was participated in by Drs. L. G. Woodford, A. H. Gunderson and W. H. Fulton. Dr. M. C. Riddle was elected to membership.

Wedding. Dr. George F. Cook and Mrs. Ella Musser, both of Bellingham, were married in Seattle March 22.

## IDAHO

County Physician Appointed. Dr. H. H. King of Montpelier has been appointed county physician during the absence of Dr. Guyon.

Dr. Charles L. Gritman of Moscow has been named resident physician and surgeon of the Northern Pacific Railway to succeed the late Dr. W. H. Carrithers.

Dr. E. L. Spohn of Priest River has moved to Coeur d'Alene, where he will engage in practice. He has disposed of his interests at Priest River to Dr. Harold C. Soucey, formerly of Portland.

**Idaho Falls Medical Society** held its annual meeting at the Bonneville hotel in Idaho Falls April 4. Dr. C. M. Cline was elected president for the ensuing year.

### OBITUARIES

**Dr. Wellington Prude McAdory**, La Grande, Ore., died unexpectedly in his office April 18, aged 55 years. He was born near McCalla, Ala., in 1875, and graduated from the University of Virginia Department of Medicine, Charlottesville, Va., in 1807. He then located in Birmingham, Ala., where he practiced for several years and was a member of the faculty in the Birmingham Medical College. He moved to La Grande in 1924 and remained in active practice there until his death.

**Dr. John N. Smith**, Salem, Ore., died suddenly at Newport April 19, aged 78 years. He was born in Iowa in 1852, and graduated from Willamette University Medical Department in 1886. He practiced at Buena Vista and at Dallas, later moving to Salem, where he was in practice for thirty-two years. In 1915 he was appointed superintendent of the state institution for the feeble minded at Salem and occupied this position until January of this year, when he resigned on account of poor health.

**Dr. George Ellsworth Chamberlain**, Aberdeen, Wash., died suddenly at his home April 17, aged 66 years. He was born in Indiana in 1864, and graduated from the University of Illinois College of Medicine, Chicago, in 1893. After practicing for several years in Minnesota and New York he came to Aberdeen in 1905. He was the founder of the Aberdeen General hospital and served continuously as its president until 1928.

**Dr. John Samuel Stott**, retired physician of Portland, Oregon, died at his home April 13, aged 73 years. He was born in Tigard, Oregon, in 1858, and graduated from Willamette University Medical School, Salem, in 1883. He first located at Tigard and later moved to Portland, where he remained in practice until his retirement five years ago.

## REPORTS OF SOCIETY MEETINGS

### OREGON

### PORTLAND CITY AND COUNTY SOCIETY

Pres., F. A. Kiehle; Secty, H. P. Rush

Portland City and County Medical Society met April 2 at the United States Veterans' hospital in Portland.

A symposium on "Encephalomyelitis" was given by Drs. C. S. Armstrong, F. J. Ernest and J. M. Perkins.

The meeting April 16 took place in the Auditorium of the Medical-Dental Building. Scientific papers were presented by Drs. A. W. Holman and R. E. Watkins.

### WASHINGTON

### KING COUNTY MEDICAL SOCIETY

Pres., D. H. Houston; Secty., A. J. Bowles

King County Medical Society held a general meeting in the auditorium of the Medical-Dental Building, Seattle, April 7, with President D. H. Houston in the chair. About one hundred and thirty members were present. Minutes of the meeting of March 3 were read and approved.

An interesting case of coccidioidal granuloma was presented by Dr. B. E. Nutting of King County hospital. The pathology was discussed by Dr. T. A. Kennedy. The patient was presented together with microphotographs of pathologic tissues, smears and cultures of the organism.

Dr. C. J. Johannesson, of Walla Walla, read a paper on "Cholecystography, Correlated with Gastrointestinal Studies," illustrated with lantern slides. Cholecystitis is one of the most common abdominal diseases. The chronic case is commonly neglected for an indefinite time because of insidious onset. In order to obtain a satisfactory shadow from the administration of tetraiodophenolphthalein it is necessary for the bile to remain in the gallbladder for several hours. Accordingly food should be withheld for twelve to sixteen hours. The prompt disappearance of the gallbladder shadow after a meal rich in fat is one of the criteria of its normal function, namely, its contractive or emptying power. One of the most important factors in cholecystography is obtaining perfect films. Movement is one of the most annoying factors which will often obscure the shadow. The finer the precipitate the more of the dye is absorbed with less laxative action. This depends largely upon the degree of colloidality. To get best results one should use the method and technic with which he is most familiar. Close cooperation is necessary between patient, surgeon and roentgenologist. The paper was discussed by Drs. M. F. Dwyer and B. S. Paschall.

Dr. C. A. Smith discussed "Galvanic Therapy." It is a unidirectional current, always flowing from positive to negative pole. Hence identification of the pole is always essential. Characteristics of each pole were explained with consequent applications in conditions of disease. Galvanic ionization was described and various uses of this principle were cited in pathologic conditions. Interpolar manifestations of the current were discussed with explanation for its use in various conditions of disease, particularly in paralyses and different arthritic conditions. There was a brief discussion of the reactions of degeneration, attention being called to the use of the faradic and galvanic currents to differentiate organic disease of nerves. The paper was discussed by Dr. E. Weldon Young.

Drs. S. N. Berens and F. H. Wanamaker were elected to membership. Applications of membership were read from Drs. C. A. Fitzgerald, N. W. Murphy and T. G. Sutherland.

It was announced that a photographer, with studio in the Shopping Tower, will photograph members to provide an album of record for the society.

### PIERCE COUNTY MEDICAL SOCIETY

Pres., C. F. Engels; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held at the Mountain View Sanatorium, Tacoma, April 8, 1930, President C. F. Engels in the chair. The meeting was preceded by a dinner served in the sanatorium dining room by the Commissioners of Pierce County. A motion was made and carried unanimously thanking the staff of the sanatorium and the county commissioners for the delightful dinner served and the opportunity to hold the meeting at the institution.

PROGRAM

"Hypophyseal Tumors." Dr. W. C. Paul. A report was given of three cases coming under observation during the last few years. The paper was illustrated by lantern slides and was discussed by Drs. M. T. Nelsen and A. W. Howe.

"Putting the Lungs at Rest in Pulmonary Diseases." Dr. John F. Steele. Many roentgen-ray films were shown, illustrating the different methods of aiding nature in resting the lungs in various pulmonary conditions.

Following this paper a moving picture film, entitled "Diagnosis of Childhood Tuberculosis," was presented by courtesy of Pierce County Tuberculosis League.

## SPOKANE COUNTY MEDICAL SOCIETY

Pres., C. B. Ward; Secty., R. P. DeRiemer

The regular meeting of Spokane County Medical Society held at Spokane April 10, was preceded by a dinner in the Paulsen Medical and Dental Building auditorium. Dr. John Neely acted as toastmaster, relating many incidents of his early practice which were highly amusing.

### PROGRAM

Case report. "Rare Hemangiosarcoma with Cardiac Metastasis." Dr. C. W. Countryman. Slides and motion picture by Dr. R. F. E. Stier. Discussion by Dr. A. T. R. Cunningham.

"Functional Disturbances of the Colon." Dr. Donald Palmer. Discussion by Dr. Geo. Anderson.

"Surgical Treatment of Unilateral Pulmonary Tuberculosis." Dr. Joseph Lynch. Discussion by Dr. J. M. Nelson.

Dr. F. C. Gibson was unanimously elected to associate membership.

Dr. Ward announced forthcoming trips to Wallace and Yakima.

## WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., J. T. Rooks; Secty., C. J. Johanneson

Walla Walla Valley Medical Society held its monthly meeting at Walla Walla, April 9, at the Grand Hotel. Besides local members there were visiting physicians from Yakima, La Grande, Lewiston and other neighboring towns.

Dr. A. B. Dykeman of Portland delivered an address on "Ophthalmology in Medicine and Surgery." He stated that often examination of the interior of the eye first reveals signs of systemic disease. In all obscure cases, if the family physician is not satisfied with his own diagnosis, the patient should be referred to a competent ophthalmologist.

Dr. Wilson Johnston of Portland gave an address on "Eye Pathology," illustrated by lantern slides. Nearsighted people should have frequent eye examinations, since they are prone to develop destructive changes which may lead to complete blindness that may be averted by early treatment.

Dr. Carroll Smith of Spokane discussed "Cooperation Between the Family Physician and the Ophthalmologist." He gave a resume of the present status of glaucoma. With the beginning of this disease people often purchase eye glasses over the counter, in the vain hope of correcting faulty vision. Destructive results often following this course may be prevented by early consultation with the ophthalmologist.

# BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

PSYCHOLOGY. Normal and Abnormal. With Special Reference to the Needs of Medical Students and Practitioners. By James Winfred Bridges, Ph.D., Professor of Psychology in the Faculty of Medicine, McGill University. 552 pp. D. Appleton & Co., New York and London, 1930.

Instead of championing one particular school of psychology the author presents views from the various schools, seeking to reconcile apparently divergent views whenever possible. In the first chapter he answers the question, "what is psychology," by presenting a sketch of the development of the science by giving five definitions of psychology, each of which represents a stage in its development. Psychology was considered as the science of the soul in ancient and medieval times, then as the science of the mind; next, about the middle of the nineteenth century as the science of consciousness. Following this is given the very recent definition of psychology as the science of behavior, finally reaching the point of view of the double-aspect theory of mind-body relation or the science of both consciousness and behavior.

Under "philosophical foundations" is discussed the relation of psychology to philosophy and the fact is noted that psychology is not yet an exact science, although with experiments under controlled conditions some results have been achieved which may be regarded as exact. He adds, "No science can be regarded as very exact so long as it is possible to have schools representing different standpoints within that science." The author is an optimist regarding the future of psychology, but a student who does not allow his enthusiasm to run away with his judgment.

The fourth and fifth chapters discuss respectively the mechanism of behavior and consciousness and the unconscious; then follow chapters on attention, sensation, perception, reflexes and instincts, feeling, emotion, habits, memory, images and ideas, imagination, thought, etc. The chapter on "motivation of behavior" contains much of interest in a few well written pages. In fact, throughout the book one is impressed with the clearness and directness of the author's style. He presents a difficult and debatable subject without verbosity, nor does he wander off into by-paths to discuss pet personal theories. Medical readers will find especially helpful the chapters on mental conflict and its consequences, intelligence and intellect, psychopathology and applied psychology.

In discussing applied psychology the author writes, "it is obvious that, in order to apply psychology in medicine, it is necessary to have a thorough knowledge of medical practice and problems, and this requires medical training." a statement that will be appreciated by neurologists and psychiatrists who often find their patients treated (?) by lay psychologists, or possessing a fund of psychologic misinformation. After a brief reference to the application of psychology in educational, industrial and legal problems he takes up medical psychology under the headings of prevention, diagnosis and treatment. Under the latter heading it is a pleasure to note that he does not overemphasize the psychoanalysis of Freud, but also pays attention to the rest cure of Weir Mitchell, the value of play and work, persuasion and reasoning as set forth especially by Dubois and Dejerine, suggestion both in the hypnotic and waking state and even autosuggestion as made popular by Coue. This book is heartily recommended to the medical reader as a sane, well balanced and comprehensive treatise on a subject which is not generally given sufficient attention by the profession. An excellent bibliography concludes the volume. Price.

Otosclerosis. A Resume of the Literature to July, 1928. Compiled under the Direction of the Committee on Otosclerosis, American Otological Society. Arthur B. Duel, M.D., Editor. Volumes one and two. $15.00. Paul B. Hoeber, Inc., New York, 1929.

This book is not one that can be read with ease. It does not give any definite etiology, course or treatment of the disease but merely ideas, facts and theories of all writers on this subject. Of particular interest are the postmortem reports of various authors on the gross and microscopic changes in the stapes and labyrinthine capsule. One must sort out and take what seems to be the consensus of opinion in order to come to any definite conclusion. Following this line of reasoning, one gets the idea that otosclerosis is an hereditary and not a contagious disease, is not one caused by infection but is probably due to some endocrine dysfunction. In conclusion, it might be said that a careful reading of this book will be of great aid to the specialist in diagnosing these cases. Wanamaker.

The Normal Diet. A Simple Statement of the Fundamental Principles of Diet for the Mutual Use of Physicians and Patients. By W. D. Sansum, M.S., M.D., F.A.C.S. Director of the Potter Metabolic Clinic, Santa Barbara Cottage Hospital, Santa Barbara, Calif. Third Revised Edition. 134 pp. $1.50. The C. V. Mosby Co., St. Louis, 1930.

A new edition of this monograph indicates its popularity and the need of a simple, rational treatment of the subject. The author states that diet errors are very common and responsible for many minor as well as serious ailments. The principles involved are discussed, as bulk requirement of the body, acid ash type of acidosis, acetone type of acidosis, caloric, protein, mineral, vitamin and water requirements of the body. A chapter on diet menus illustrates how such diets may be built without violating any of the fundamental principles. This volume is well worth reading by everyone interested in prescribing a correct diet.

Varicose Veins. With Special Reference to Injection Treatment. By H. O. McPheeters, M.D., F.A.C.S. Director of the Varicose Vein and Ulcer Clinic, Minneapolis General Hospital, etc. Illustrated with Halftones and Line Engravings. Second Revised and Enlarged Edition. 233 pp. $3.50. F. A. Davis Co., Philadelphia, 1930.

The demand for this popular work is indicated by the appearance of the second edition a year after the first. The author states that many points were not made sufficiently clear to the general practitioner, special reference being made to the Trendelenburg test. A chapter is devoted to clarifying this subject. Of special value are the chapters dealing with complications associated with varices and the treatment of ulcer cruris, the latter being the greatest bugbear associated with varicose veins. The details of treatment are so thoroughly outlined in this book that its perusal is essential for the care and successful treatment of this condition.

Insomnia. How to Combat It. Joseph Collins, M.D., Author of "The Doctor Looks at Love and Life," etc. 130 pp. D. Appleton and Company, New York and London, 1930.

This subject is treated in the author's free, easy and inimitable style that characterizes all his recent literary productions. In discussing the nature and cause of sleep he mentions the latest theory and one which is meeting with wide acceptance by both physiologists and physicians, that it is the result of inhibition from within of conditioned reflexes. He goes on to say that insomnia is a relative term. The amount of sleep that suffices for one individual would be in another productive of misery and a disorder of nutrition which might lead to disease.

Insomnia is broadly divided into two distinct classes for the purpose of determining proper treatment: First, springing from purely physical causes; second, insomnia derived from mental, moral or emotional causes. The first has its origin in physical pain or discomfort. It may be a mashed thumb, rheumatism, cold feet, indigestion, influenza or the toothache. Generally, the treatment is simple. Remove the cause and the effect will disappear. Ease the aching tooth and sleep will come. The other insomnia is born of grief, cares, expectations, anxieties, preoccupation and all violent perturbations of the mind. Not infrequently it is the initial symptom of many mental diseases.

Charles Darwin, Napoleon, Frederick the Great, Charles XII, the Duke of Wellington were illustrious insomniacs and the citation of these famous men has assisted the author in the treatment of the malady. Further under treatment, since the chief source from which insomnia flows has to do with a troubled mind, it follows that the most effective remedv is restoration of tranquility and control of the mind. Fear of sleeplessness must be banished. The question of types of beds, physical exercise, massage and the various drugs is taken up, ending with a discussion of hypnotism and suggestion. Insomnia is to be cured by enlightenment, determination and discipline, not by drugs, coddlings and self-indulgence. Rohwer.

Symptoms of Visceral Disease. A Study of the Vegetative Nervous System in Its Relationship to Clinical Medicine. By Francis Marion Pottenger, A.M., M.D., LL.D., F.A.C.P. Medical Director, Pottenger Sanatorium for Diseases of the Lungs and Throat, Monrovia, Calif., etc. Fourth Edition. With Eighty-seven Text Illustrations and Ten Color Plates. 426 pp. $7.50. The C. V. Mosby Co., St. Louis, 1930.

In this book, about the first hundred pages deal with the general anatomic, physiologic and pharmacologic aspects of the vegetative nervous system, and is largely a routine compilation of known facts, with the excellent and time honored standard vegetative neurologic charts of Meyer and Gottlieb, Gaskell and others prominently displayed. Most of the rest of the book deals with the vegetative nerve supply of the various organs with inadequate clinical discussion. The book is primarily intended for clinicians, as evidenced by the title and by the author's statement in the preface that it is his aim to discuss visceral neurology "in such manner as to make it readily applicable to clinical problems." Yet herein lies the major shortcoming of the book.

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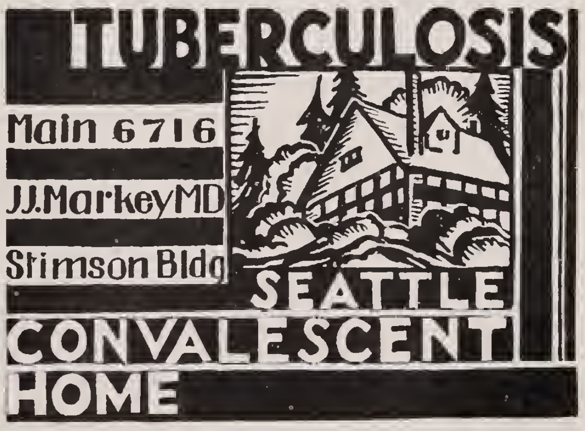

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(both sympathetic and parasympathetic) and also because of the frequency of gastric symptoms in so many varied clinical states. Ten pages only are devoted to this subject under the title, "Clinical Consideration of the Stomach," in which it is stated that, "if we study gastric symptoms from the standpoint of visceral neurology, we can approach such conditions as nausea, vomiting, hypochlorhydria, hyperchlorhydria, hypomotility, hypermotility, pylorospasm and dilatation of the stomach, in a manner which makes many of them intelligible which would otherwise be inexplicable; and also in a manner which will often point the way for their relief." It is difficult, if indeed, possible, to find the promised answer to the foregoing in at least any reasonably adequate degree. The book is replete with vague and general statements without adequate evidences of the truth or proof of assertions. The reviewer confesses to an inability to secure practical helpful information in relation to the study of visceral symptomatology.

A. L. JACOBSON.

THE MECHANISM OF THE LARYNX. By. V. E. Negus, M.S., London, F.R.C.S., England. Junior Surgeon for Diseases of the Throat and Nose, King's College Hospital, London, etc. 528 pp. $16.50. The C. V. Mosby Company, St. Louis. 1929.

This is a study of the comparative anatomy and physiology in a wide range of animal species. It is the result of years of work. The larynx is commonly known as the organ of voice, yet thousands of species which have a larynx never or practically never make use of a voice. The author has shown the all important function of the larynx, "that of preventing the entrance into the pulmonary air tract of any substance except air." The larynx is really a sphincter and in the higher animals particularly man, the vocal cord is a highly developed addition, whose function it is to produce voice, but not primarily to keep food out of the trachea. The false cords and the other sphincteric muscles are for that purpose.

The epiglottis in lower animals is longer, is in close relation with the soft palate and directs the air current through the nose. It is primarily evolved for purposes of olfaction. In man it is shorter, and does not have much function. It does help some to keep food out of the trachea. The author has made a detailed study of the mechanism of phonation. The last chapter of twenty-six pages is excellent, covering the anatomy and physiology of the human larynx. This work will stand for years to come as a reference on the evolution, structure and phyiology of the larynx.

WEBER.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 13, Number 5. (Chicago Number, March, 1930.) Octavo of 207 pages with 17 illustrations. Per Clinic Year, July, 1929 to May, 1930. Paper, $12.00; Cloth, $16.00 Net. Philadelphia and London: W. B. Saunders Company, 1930.

A description of errors is often a valuable source of instruction. Williamson and Birch discuss mistakes in diagnosis as revealed by autopsy. In their hospital work 80 per cent of deaths were followed by postmortems. Nine errors in diagnosis were discovered in 128 autopsies. Three were diagnosed wrongly, five in a way partly wrong, and in one they failed entirely in making a diagnosis. Each case is discussed in detail, explaining why the errors resulted. Pollock gives an interesting discussion of disorders of sleep. Nightmares may be due to peripheral stimuli, resulting from partial asphyxiation from poor ventilation or excessive bedding. There is an interesting consideration of somnambulism and death trance, these being exhibitions of hysterical sleep. Narcolepsy has a similar origin. Curious illustrations of this condition are cited. The administration of hypnotics is injurious because it establishes a bad mental habit. Inability to sleep is often an expression of a neurosis. Other reports cover a variety of interesting conditions of the heart and circulation, endocrine disorders, besides cases in children of appendicitis, uremia and dermatologic affections.

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USE OF PATENT REMEDIES BY TUBERCULOUS PATIENTS. Linsly R. Williams and Alice M. Hill, New York (*Journal A. M .A.*, April 26, 1930), report that the National Tuberculosis Association, as part of its study of what happened to a group of tuberculous patients prior to their first admission to a sanatorium, queried each patient regarding the "patent remedies" used. The number of patients who reported that they had used "patent remedies" was comparatively small—only 261, or 17.4 per cent, of the whole group of 1,499 whose histories were obtained. However, not all of the patients who said that they used "patent medicine" actually did. Apparently what they meant in a number of instances was merely that they had used medicines on their own initiative. Eighty patients of the 261 who said that they had used "patent remedies" actually had not done so. Certain patients used only one medicine, some medicines were used by only one patient, but altogether patients reported 113 instances of the use of some specific accepted remedy. In more than half of these instances the medicine used was cod liver oil alone in an official form; in still others it apppeared in combination with some other therapeutic agent; the other medicines, with few exceptions, have nutrient value or are usually considered helpful in the case of a cough. The number of patients, then, who said that they used "patent remedies" prior to their first admission to a sanatorium and who actually may have done so was 181, or 12 per cent of the 1,499. There remain for consideration fifty-two remedies without official standing whose use was reported a total of 143 times by patients interviewed by the physicians, and thirty-three remedies whose use was reported a total of fifty times by patients interviewed by one of the authors, a laywoman. The reported use of "consumption cures" was greater, relatively, than that of other unaccepted remedies, being 32 per cent of all instances in which such remedies were used by patients interviewed by a physician and 38 per cent of those in which an accepted remedy was used by patients whose histories were obtained by a lay person. In addition, a number of patients reported using medicines which they probably would not have taken had they not been misled by the title, as in the case of certain medicines which purported to be preparations of cod liver oil but which contained such a small amount of the oil as to be ineffective. The number of sanatorium patients who have taken medicines of the "consumption cure" class appears relatively small. They formed only 3 per cent of the group of 1,499 interviewed by physicians. But 15 per cent of the 116 patients reviewed by a lay person had used them. It is improbable that the general run of patients who do not enter sanatoriums use them in lesser degree. Certainly the percentage is large enough to indicate that further education of the public is needed.

# NORTHWEST MEDICINE

THE JOURNAL OF THE STATE MEDICAL ASSOCIATIONS OF OREGON, WASHINGTON, IDAHO, AND PACIFIC NORTHWEST MEDICAL ASSOCIATION

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## ORIGINAL CONTRIBUTIONS

## DIAGNOSIS OF GALLTRACT DISEASE*

William A. Swalm, M.D.
PHILADELPHIA, PA.

I desire to bring before you a subject, which during the past decade has interested many investigators of real merit. The early diagnosis of galltract disease requires a knowledge of the importance of interrelationship of the digestive complex, embracing the liver, gallbladder, gallducts, pancreas, duodenum and stomach, and indirectly the heart, kidneys, spleen and intestinal tract.

The speaker has chosen chronic gallbladder and duct disease because time is not sufficient for a general resume of the galltract system as a whole. The gallbladder is only a unit in this complex system of lymphatic, blood and nerve contacts, too great emphasis probably having been centered upon it alone in the past concerning symptomatology and treatment. Most authorities regard this disease as the most frequent abdominal infection and physicians in general realize that earlier recognition is necessary, if late pathology is to be avoided.

The etiology is still a mooted question and various investigators have shown evidence that the portal of entry may be considered from one, or a combination of lymphatic serosal extension (Graham and coworkers[1]), muscosal (Meyer,[2] and Lyon,[3] etc.), hematogenous (Rosenau,[4] etc.) and the generally conceded portal drainage from stomach to upper rectum. Focal infection no doubt plays an important role. Acute infection may cause complicated vascular and cellular response, and though one or several acute inflammatory involvements of the gallbladder may resolve without leaving behind a scar, recurrent infection tends to produce a chronic inflammation.[5]

There may be areas of peritonitis in the serosa with adhesions to other structures. These changes in structure obviously are likely to produce disturbances in the normal physiology of the organ regarding absorptive activity (concentration and accumulation of lipoids) and motility (distensibility and contractility). Experimental studies have shown that the gallbladder is part of the mechanism whereby the secretory activity of the liver is correlated with that of the gastrointestinal tract. Whitaker[6] noted that emptying of the gallbladder did not occur, if the animal was ill, and it has been shown that pregnancy may interfere with normal emptying.[7] Thus the physiologic, metabolic and pathologic states of the body indirectly affect the normality of the galltract.

Multiple pregnancies with biliary stasis and hypercholestermia have been held responsible for the greater frequency in females, but it is interesting to note that Alvarez found the high disproportion of six females to one male in a study of proven cases under fifteen years of age.[8] He also found in a study of sixty operative cases the average duration of symptoms was nineteen years.[9] That many cases begin in childhood is also shown by the fact that Eusterman[10] reported one hundred and seventeen cases and Snyder[11] reported three, the symptoms of which were acute appendiceal inflammation. Graham (loc cit) found in his records at the St. Louis Hospital during the past ten years eight cases of cholecystitis occurring between the ages of one and a half to fifteen years, confirmed by operation or autopsy. All of the cases at operation were found to have large distended gallbladders which were reddened and inflamed but which showed very little thickening of the wall itself and few adhesions. I have found many more cases by careful study and interpretation of gastric, duodenal and bile aspirates, especially in the second decade of life. (I was unable to gather statistics because of brevity of time in preparation).

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* Read before the Fortieth Annual Meeting of Washington State Medical Association, Yakima, Wash., Aug. 29-31, 1929.

A searching historical narrative in the cases presenting third or fourth degree symptoms during the fourth or fifth decade of life will often reveal the fact that supposed catarrhal jaundice or vague indigestion was present in childhood, associated with mild so-called bilious attacks, headache, constipation, possibly flatulence, neurasthenia, etc. These early vague cases can be more readily studied by proper cholecystographic methods mentioned by Graham-Cole (loc cit) and nonsurgical biliary drainage, adhering in detail to the Lyon technic.[12]. My experience is that this biliary drainage study is indispensible in detecting pathologic physiology, the forerunner of established disease. To this phase we will return. Another important point to bear in mind is that a common source of infection will be found in the mouth and its connected appendages,[13] the gums, teeth, tonsils and sinuses, nasopharynx, bronchi or middle ear disease, the gentiourinary and intestinal tract, especially the appendix.

This explains the frequency of gastrointestinal symptoms after influenza, bronchopneumonia or even chronic nasopharyngitis, especially in the patient whose defenses are weakened and pathogenic bacteria abound, who is given liberal amounts of indigestible food too soon after the attack and probably excessive medication before the native defenses have sufficiently returned. Any part of the gastrointestinal tract may be invaded by bacteria which pass through the walls and are taken up by blood or lymphatic channels to be disseminated through the portals.

I frequently find in the history that the patient in early life had one or more attacks of tonsillitis, followed shortly by appendicitis, inflammation of the aptly termed abdominal tonsil, who later develops symptoms referrable to the galltract, ensuing in regular sequence. Schneider[14] also has observed that frequently a severe angina, typhoid fever, pneumonia or acute appendicitis has preceded the onset of cholecystitis by a few weeks or months during the first or second decades.

Then there develop (1) "toxemic symptoms, periodic headaches attended or not by nausea and followed by several days of food repugnance often very migraine-like." We might add lassitude, tendency to constipation, coated tongue, etc. (2) "Reflex digestive symptoms, fullness, belching, sour eructations, foul taste, qualitative dyspepsia." The dyspepsia varies with short exacerbations, rarely causing the patient to seek medical advice, and yet seldom free of symptoms for a long time such as we find in the ulcer case. Flatulence is frequently present. Reflex asthma may occur at this stage but I have more often seen it in the later ones. Attempt should be made however to rule out food allergy, e.g., ingestion of wheat producing abdominal symptoms.[15]

It is important to note that at this time in the cycle of development there are no localizing physical signs, and roentgen-ray observations by usual methods are negative. However, since cholecystography has been refined, many cases respond to the dye test with a poor shadow or positive cholecystogram. This reveals the fact that the gallbladder and its lymphatic structure, so important in its function of absorption, is being seriously compromised, which may account for faulty lipoid metabolism and cholesterosis with so-called strawberry formation. In the early stages of cholecystitis and choledochitis, we find by nonsurgical drainage that the reaction to low grade inflammation or to subinfection is at first a catarrhal process, involving the mucous membrane, with an outpouring of mucus, revealing microscopically abnormal denudation of galltract or duodenal and sometimes pyloric epithelium and abnormal numbers of bile stained lymphocytes or polymorphonuclears together with an oleagenous material, depending on the degree and acuteness of the inflammation.[16]

The speaker has seen these elements in the microscopy of aspirates during biliary drainage on many occasions. I have also seen during a series of postoperative follow-up cases at the Samaritan Hospital of Temple University these same types of findings in general, explaining symptoms present and representing residual low grade cholangitis, duodenitis and pyloritis, which respond very well to tube drainage therapy, couplied with general medical management. These will be reported upon later.

During the third and fourth decades history and physical examination will probably be more suggestive of gallbladder disease and ninety per cent can be definitely checked by nonsurgical biliary drainage and correlated with cholecystographic study in seventy-five per cent of my cases. As time goes on indigestion often leads to vomiting without definite relief, belching for relief becomes more pronounced and continuous, and the early hyperchlorhydria is in transition stage to hypochlorhydria. The patient may now complain of sensations, ranging from pin and needle to dull aching sensations in the right hypochrondrium, radiating to the scapular region, particularly on the right. This increases until a gradual attack of pain develops under the right rib margin, sometimes associated with chilliness and mild to moderate fever with possibly leucocytosis and distension, lasting from one-half to two or three days and not requiring a hypodermic injection. If the lymphatics of the duodenum and pancreas are involved, pain across the upper lumbar region may be present with regurgitant vomiting of bile stained material and sometimes diarrhea. Here the macroscopic and microscopic examination of the stool will frequently aid in revealing subfunction of pancreatic and intestinal digestion.

Then the well advanced disease, in which stones frequently have formed during stasis, infection and altered chemistry of bile, or an intercurrent acute exacerbation with sudden flare up of a previously smouldering inflammation may ensue with pain and tenderness over the gallbladder, fever, reflex vomiting and possibly jaundice (more often in stones), calling attention to the site of disease. If a preexisting stone migrates or attempts to do so as a result of reflex peristalsis, the cause may be (1) mechanical jolting, as in a rough automobile ride, stooping, stretching or violent exercises, (2) psychic anger, (3) menstrual or certain states in the gravid uterus and (4) dietetic ingestion of high fat diet, particularly mayonnaise or other high indigestible foods. The description of the colic attack is so characteristic that the story by itself clinches the diagnosis.[17]

The feature is of dramatic suddenness in onset, violence of pain, its site at the right costal margin, radiation around the right side and under the right shoulder blade, at times to the ensiform region and if much gaseous distention to the left scapula, lasting for hours, usually relieved by a single opiate injection. There is residual soreness after the acute pain has abated but maximum at the ninth costal margin with plus tension or rigidity of the upper right rectus. Between colic attacks there is present sufficient fullness and sense of weight soon after eating, with persistent gas formation and constant belching, to cause the patient to think she is suffering with so-called "stomach trouble." The above manifestations seem to be more often seen in those with tendency to obesity, overindulgence in food, lack of exercise or sedentary type of life and of hypersthenic habitus.

From the fourth decade on advancing local changes and complications may be expected, comprising such surgical calamities as empyema of the gallbladder, gangrene, obstruction of the common duct, pancreatitis, rupture or perforation, peritonitis, intestinal stone obstruction and malignant disease, the symptoms and diagnosis of which time will not permit an enumeration thereof. A consideration of this phase has been published by Else[18] and a perusal of his paper will repay the reader.

So far as history is concerned there is no symptom of these complications that cannot be produced by chronic cholecystitis, except that of a palpable tumor. Loss of weight, appetite, color and strength may occur in the course of gallbladder disease without meaning malignant degeneration.

Physical examination in this disease may be uncertain and in cases with negative findings a thorough history is especially important, together with laboratory aids. In the interval stage, in which there is no active inflammation, palpation in chronic cholecystitis will give little information as a rule. However, tenderness over the gallbladder area, no matter by what method, is not enough to justify a diagnosis. Carnett's recent contributions on intercostal neuralgia should be given careful scrutiny and the methods of procedure practiced.[19] Murphy's sign, which consists of a sudden jab of the thumb or fingers upward under the right costal margin just as the patient has completed a deep inspiration, may elicit tenderness which might otherwise be missed in subacute or chronic cases. After full expiration thumb pressure at the tip of the ninth rib under the costal margins (the fingers more lightly grasping the lateral costal margins) may on full inspiration not only elicit pain but interfere with the free respiratory movement of the diaphragm on the right side. Riesman's ulnar concussion test, which consists of having the patient take and hold a full inspiration when the examiner strikes in turn both the upper right and left quadrants with the ulnar edge of the hands, is another method for eliciting galltract tenderness.

These and other tests are only of value, depending on whether or not there has been recent acute or subacute inflammation of the gallbladder or ducts. If present, one can expect to find increased resistance and rigidity in the right hypochondrium. In these patients with thin abdominal walls an enlarged gallbladder area indicates some complication and usually means (1) acute virulent inflammation with rapid distention and threatened perforation, (2) obstruction of the cystic duct by stone and gradual distention of the gallbladder by accumulation of mucus or low grade purulent material or (3) cancer of the gallbladder. We must also consider a Riedel's lobe, usually meaning gallbladder infection, or accessory lobe of the liver and of course palpable kidney.

Lyon describes (loc cit) a tuning fork auscultatory test which I have found fairly accurate in diagnosing adhesions in the upper right quadrant.

The laboratory aids of assistance in arriving at a diagnosis consist briefly of stool, urine and blood analysis, spinal fluid, allergic reactions, basal metabolism, study of gastric contents, (1) biliary regurgitation; (2) a clean achylia is more often associated with gallbladder disease than any other gastric disease; roentgenographic study, liver function studies and nonsurgical duodenobiliary drainage. Regarding roentgenography there are two outstanding factors to be borne in mind concerning cholecystography.

1. If the gallbladder fills, concentrates, alters its size and empties, it is believed to be normal, regardless of the method by which dye is given. Graham says (loc cit) that the capacity to estimate normal concentration is gained by experience. I have seen several patients in whom pathologic gallbladders were revealed by drainage and checked by operation, whose gallbladders filled, concentrated and emptied sufficiently to be placed under this normal category. Eusterman,[20] and Mateer and Henderson[21] hold the same view. Lyon and the speaker reported (loc cit) cases, in which a positive cholecystogram was converted into a negative after topical treatment by biliary drainage. This referred to obstruction of the cystic duct of a catarrhal variety.

Cholecystographic study cannot differentiate between cystic duct obstruction due to catarrh and that produced by adhesions, stone block or stricture, whereas this catarrhal obstruction gives an abnormal drainage sequence and a characteristic microscopic picture. Either no gallbladder fraction is recovered, or it is recovered in small amounts, and is then accompanied or preceded by the discharge of characteristic flocculi of yellow brown mucus, in shaggy slimy masses. Microscopically this mucus will be found unusually dense; often twisted or spiralled (as we think by rifling of the cystic duct) and encrusted with bile salts; but the important finding is an oleagenous material, ranging from pale to bright yellow which melts out into globules, pools and lakes. By chemical test this appears to be a fatty ester of cholesterol.

When infection has taken place and inflammation progresses beyond the catarrhal stage, there will be found, in addition, bile stained colonies of culturally viable bacteria, collections of pus cells and often increased exfoliation of bile stained columnar epithelium. We believe that this microscopic picture is pathognomonic of cystic duct obstruction when due to catarrh, and in many cases appears to be one of the earliest signs of grade one cholecystitis as well as a condition which often accompanies the later grades of pathologic change. These patients, who are usually intolerant to fat intake, may return to fat full diet after the obstruction has been overcome by duodenal drainage.

2. The cholecystographic shadow is dependent upon the weight of the patient, thickness of abdominal wall, consideration of the density of other structures in contrast with gallbladder and method of administration of the dye. Obviously the intravenous method is more accurate.

The proper technic and discussion of differential diagnosis by nonsurgical drainage is fully discussed in a monograph written by Lyon and published in 1923 by Lea and Febiger. Eight years ago I was skeptical as to the value and dependability of this method. Realizing that the differential diagnostic value of the cytologic findings depended upon the validity of their assumed sources, I began a study of autopsy cases. Fourteen cases were studied in 1927 at the Lankenau Hospital, while the autopsy was in progress or immediately thereafter. Miscellaneous cases were taken, such as those dying of pneumonia, cerebral apoplexy, leukemia, accidental deaths, etc. In general the microscopic findings of the scrapings of stomach, duodenum, gallbladder, hepatic and common ducts corresponded very closely to Lyon's description.

Piersol, Bockus and Shay[22] contributed a valuable study of forty-six cases of gallstone disease by this method. They described the diagnostic importance of a pigmentary deposit appearing as a lustrous, golden yellow, more or less granular precipitate. The color varies from a pale yellow to deep orange and there is no other element in bile which can be mistaken for it, its typical morphology and physical characteristics. Jones[23] undoubtedly referred to the same pigment, calling it calcium bilirubinate. In fifty per cent of these cases the "B" fraction presents a brick brown or reddish color.

I might add a few miscellaneous suggestions which experience has taught me, having personally examined 20,000 specimens by this method during a period of eight years. Inexperienced technicians or physicians performing microscopic studies must devote ample time to at least two slide specimens of the sediment in each bottle obtained, as only one study will frequently miss the diagnostic findings unless they are noticed at the first observation. If gallbladder or even liver bile is not obtained at first drainage, repeat the procedure after sedation and antispasmodics have been administered orally for several days. If gastric lavage returns fail on account of thick mucus, one may add aromatic spirits of ammonia and sodium bicarbonate, half dram of each to 250 c.c. units to cut the mucus. If after the tube reaches the duodenum, drainage does not proceed properly, it may be started by tilting upwards the glass connection, thus reducing air pressure (from smaller to larger calibre) and bile will flow more steadily throughout the drainage. In stubborn cases, atropine gr. 1/100 in 25 c.c. of warm water, clamped off for five minutes, will often facilitate the procedure. If duodenal mucus is found to be blocking the tube, lavage several times with 25 c.c. magnesium sulphate in 225 c.c. of warm water at 110° F. or essence of caroid.

In obstinate cases, in which there is difficulty encountered in obtaining "B" bile after ordinary stimulation, use a mixture of peptone, one dram to 75 c.c. of water, boiled and filtered (for microscopic reasons) with 25 c.c. of magnesium sulphate solution and atropine gr. 1/100. This mixed hormone, relaxant mixture often succeeds when ordinary methods fail. In cholecystectomized patients a weaker solution of magnesium solution (10 to 25 per cent) acts better than stronger solution. A great many mixed galltract-ulcer patients cease draining after the first stimulation. Here an antispasmodic (atropine 1/100 in 25 c.c. of warm water) will renew the drainage, but caution is essential not to immediately repeat magnesium sulphate solution. Peptone or olive oil can be given, and if no gallbladder bile is obtained, 25 c.c. of magnesium sulphate solution after the oil will invariably be followed by good results.

Difficult cases can at times be started by instructing the patient to rise on the elbow for two or three minutes, together with syringing air in and out by means of one ounce syringe. Any patient returning for therapeutic drainage, who appears nervous or under tension before treatment, can to advantage be given two bromide tablets dissolved in the 100 c.c. of warm water through the tube which is retained while swallowing the tube from stomach to duodenum, or this type may be given bromide and atropine orally on arising. Most patients relax better if given some light reading material during the drainage.

It is well to tilt the drainage bottles on specially constructed boards, as this procedure facilitates easy access to the dependent floccules to be pipetted off for cytologic study. Thus centrifugalization is not essential.

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# THE RELATIONSHIP OF HEPATITIS TO CHOLECYSTITIS*

J. Earl Else, M.D.
Clinical Professor, Chairman of the Department of Surgery, University of Oregon Medical School

Millard S. Rosenblatt, M.D.
Instructor in Surgery

Aubrey M. Davis, M.D.
PORTLAND, ORE.

Since Charcot first described the constancy of liver involvement in the presence of gallstones as found at the autopsy table, the relationship of hepatitis to cholecystitis has been disputed. This relationship may be incidental, either one being dependent upon the other; coincidental, both infected at the same time in the same way; or accidental, each being independent of the other. To determine which is most frequent resolves itself into a study of the etiology of both cholecystitis and hepatitis and the interrelationship between primary cholecystitis and secondary hepatitis, and primary hepatitis and secondary cholecystitis.

The routes by which infection may reach the liver and gallbladder are: (1) introduction by foreign bodies, (2) direct extension, (3) ascending infection through the bile ducts from the duodenum, (4) the circulation and (5) the lymph channels. The gallbladder may become infected from the liver through the bile, the lymphatics or by direct extension. The liver may become infected from the gallbladder by direct extension or through the lymphatics.

Infection through the entrance of foreign bodies is possible but rare. Infection from direct extension is not common, yet not so very rare. Infection of both the liver and the gallbladder may take place through adherent peptic ulcers.

Ascending infection involving both the gallbladder and the liver occurs and sometimes there is a very extensive liver involvement. It is rare and probably occurs only in the presence of some obstruction to the outlet of the common duct. One of us[1] found that it was necessary to ligate the duodenum above and below the papilla of Vater in order to get organisms to ascend into the gallbladder in the rabbit.

Infective organisms may reach the liver through both the portal and the general circulation. Wyssokowitsch[2] in 1886 observed that the Kupffer cells of the liver pick up organisms brought to it through the circulation. He stated that the organisms thus picked up were not discharged into the bile unless necrosis of liver cells was present. Blachstein,[3] in 1891, obtained bacteria from the bile after injecting them into the blood stream. He attributed their entering the bile to be the result of liver necrosis. Since that time similar results have been attained by authors too numerous to mention.

It has been shown that they may reach the bile from either the general or the portal circulation. Carmichael,[4] in 1903, stated that while this was true, they did not enter the bile readily from the portal circulation. Nichols,[5] in 1916, found that the readiness with which they entered the bile was dependent upon the number of organisms injected. This may be in support of the observation of Wyssokowitsch and Blachstein. While it has been proved that organisms may enter the bile from the portal vein, it has not been definitely proved they enter the portal system readily. Wrzosek believed that organisms left the intestines ordinarily through the lymphatics and, when the thoracic duct was ligated, they were only rarely recovered from the various organs from which they can be recovered when the duct is not ligated.

Bacteria injected into the general circulation have been recovered from the bile by many, but Meyers, Neilson and Feusier[6] have shown that there must be at least one billion injected into the ear vein of a rabbit in order to obtain them from the bile. There can be no question after reviewing the literature that the liver can be infected from either the portal or general circulation.

Koch,[7] in 1908, reported the finding of clumps of bacteria in the gallbladder wall. One of us, in 1909,[1] in a paper upon the etiology of cholecystitis reported work that had been done and suggested the cystic artery as a source of gallbladder infection, stating that a report upon this work would be made in the near future. This paper was published in Northwest Medicine in October, 1909, and the final report, showing that organisms readily entered the gallbladder through the cystic artery when injected into either the general circulation or the portal vein, was published the next year.

Chiarolanza[8] at the suggestion of Koch did some experimental work upon the same line which he reported in December, 1909. Nichols has criticized his work because the bile was bloody, indicating, Nichols believes, that the veins were ligated with the cystic duct. Just what difference this makes, if the cystic artery is the only method

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* Read before the Fifty-fifth Annual Meeting of Oregon State Medical Society, La Grande, Ore., May 16-18, 1929.

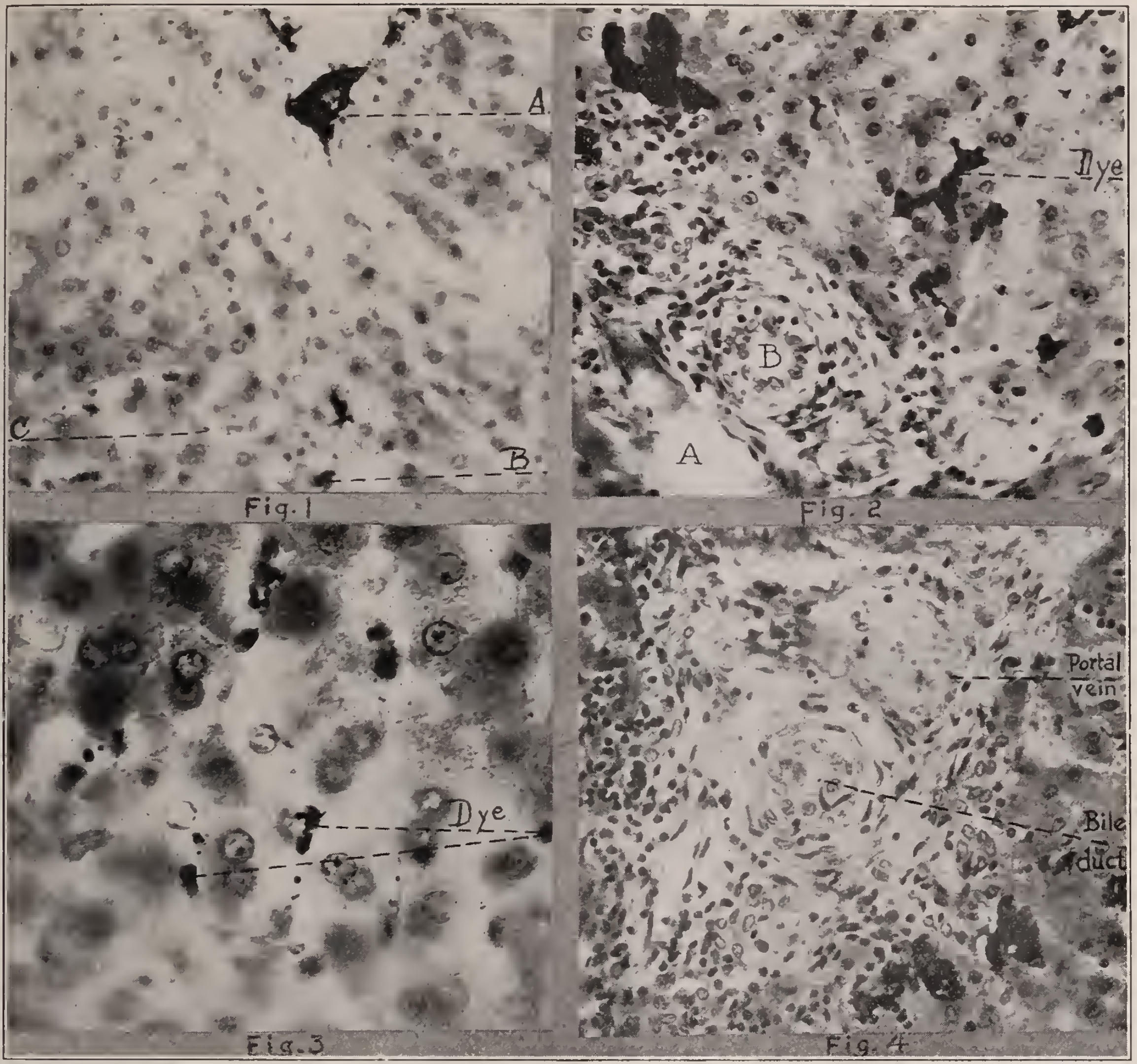

Fig. 1. India ink was injected into the retrogallbladder space. In the illustration is shown an area where it has accumulated on the surface of the liver and is being carried inward by the lymphatics. At B the india ink is seen in the capillaries and at C between the strands of liver cells.

Fig. 2. A, Portal vein. B, Bile duct. The india ink has been carried into the liver substance by the lymphatics. Interlobular deposits are seen with minute particles between the liver cells.

Fig. 3. High power, showing the india ink extending between the strands of liver cells.

Fig. 4. Shows the india ink in the periportal lymphatics with extension between the liver cells.

of organisms entering the gallbladder, is not apparent. In our work Nichol's criticism does not apply as very large Belgian hares were used, the cystic duct was carefully isolated, and there was no blood in the bile. Rosenow[9] by culture methods confirmed the previous work of Koch, Chiarolanza and Else.

Meyer, Neilson and Feusier found that the gallbladder received approximately the same number of germs per gram of substance as does the liver through the general circulation. Graham and Peterman[10] report that the gallbladder does not become infected after injecting organisms into it, unless the cystic duct is ligated or the circulation interfered with.

*Lymphatics.* The liver lymphatics are divided into two groups, the deep which enter along the capsule of Glisan, and the superficial which lie over the liver surface and pass over the gallbladder. The lymphatics of the gallbladder are intimately connected with those of the liver, as has been shown by Sudler[11] and Sappey.[12] Kodama[13] has demonstrated that there is not a close relationship of the lymphatics with those of the pancreas in contradistinction to the work of Bartels[14] and Deaver and Sweet.[15] Braithwaite[16] demonstrated a route by which lymph from the cecum may reach the lymphatics of the common duct and even as high as the gland of the cystic duct.

Miller,[17] in 1904, suggested the lymphatics as

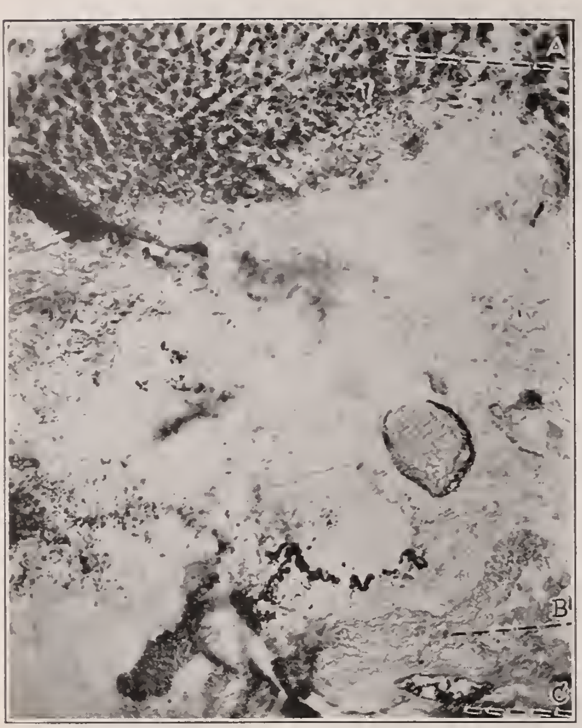

Fig. 5. The india ink is seen at the right, extending into the serosa of the gallbladder. On the left it is being carried into the liver substance, showing that the lymphatics are capable of carrying inert bodies either to the gallbladder wall or into the liver substance. A is liver, B gallbladder wall, and C dye in gallbladder wall.

the source of infection in gallbladder disease. Recently Winkenwerder,[18] in the study of the lymphatics of the gallbladder of the cat, states that he could find no evidence that the lymphatics of the liver were so intimately connected that the lymph could flow back and forth.

In order to satisfy ourselves, because of this last report, we injected india ink into the space between the liver and the gallbladder (figs. 1, 2, 3, 4, 5) and found that it was readily carried deeply into the liver and that the particles were picked up by the Kupffer cells. When the india ink was injected into the gallbladder, however, it was not carried into the liver. This we interpret to mean that, so long as organisms remain within the gallbladder lumen, there will not be an extension to the liver, but just as soon as the infection penetrates into the wall of the gallbladder, then the lymphatics may carry them into the liver with a resultant hepatitis.

### HEPATITIS AS A SOURCE OF CHOLECYSTITIS

The gallbladder may become infected from the liver in three ways: (1) by direct rupture of a liver abscess into the gallbladder, (2) through the lymph and (3) through the bile. The rupture of a liver abscess into the gallbladder is possible but rare. Graham, Cole, Copher and Moore[19] after much experimental work conclude that the lymphatic route from the liver is the usual source of gallbladder infection and cite as proof the fact that they found organisms in the liver, gallbladder wall and wall of the common duct after injecting them into the portal vein.

One of us,[20] in 1910, showed that organisms readily go into the gallbladder through the cystic artery upon injecting them into the portal vein. Meyers, Neilson and Feusier proved that organisms coming through the hepatic artery were to be found in the gallbladder wall in the same proportion as in the liver. Rosenow recovered organisms of the identical characteristics as those he injected into the general circulation from the gallbladder wall. Without blocking the general circulation to the gallbladder and the bile through the cystic duct, the finding of organisms in the gallbladder after injecting them into the portal vein has absolutely no bearing upon the controversy as to the frequency of gallbladder infection through the lymphatics from the liver.

If the lymphatic route were the frequent route, cholecystitis should be a more frequent complication of hepatitis. Acute cholecystitis should be an almost constant accompaniment of the more acute liver involvement, yet it is rare in liver abscesses. Dodson[21] recently had a patient with multiple liver abscess, in which the culture from the bile was negative. The organisms had gone through neither route, the bile or the lymphatics.

Birch-Hirchfels,[22] in 1895, advanced the theory that cholecystitis was due to organisms excreted from the liver in the bile. Graham has proved that the mere presence of bacteria in the bile is not sufficient to develop a cholecystitis. After injecting organisms in considerable numbers into the gallbladder, he had to obstruct the cystic duct or interfere with the circulation in order to develop a cholecystitis. If, then, it requires organisms in large quantities to pass through the liver into the bile and requires either obstruction or circulatory disturbance to cause them to develop a cholecystitis, it would seem quite improbable that the majority of cases of cholecystitis develop from this cause. In the presence of typhoid fever or other severe intestinal infection this may and probably does sometimes occur.

### CHOLECYSTITIS AS A CAUSE OF HEPATITIS

Although Charcot found hepatitis as an almost constant accompaniment of gallstones at postmortem, not much attention was paid to its importance until after painstaking work of Graham,[23] showing the frequency of hepatitis with cholecystitis in patients coming to operation. Since this every surgeon doing abdominal work has seen extensive hepatitis frequently in the presence of long standing cholecystitis. Hepatitis may result from cholecystitis by two principal ways: (1) extension to the liver through the bile ducts and (2) through the lymphatics.

The extension down the cystic duct and up through the hepatic duct may result in either an acute or chronic cholangitis. In the former, if mild, it may be marked by only a slight jaundice and little or no additional clinical manifestation, but if severe, the jaundice becomes marked and the clinical symptoms may be quite pronounced. In the chronic form scar tissue develops, resulting in a cirrhosis in the more extensive involvement. Hepatitis produced by extension through the bile ducts is diffuse and involves all or at least a greater portion of the liver.

The most frequent form of hepatitis observed at the operating table as a complication of cholecystitis begins as a local involvement in the immediate vicinity of the gallbladder and is, I believe, the result of the extension of the organisms through the lymphatics. Its extent and degree vary directly with the intensity and duration of the infection. In the early or mild chronic cholecystitis and in the first attack in acute cholecystitis the changes may be mainly microscopic in their nature, but in the long standing or more severe chronic cases there may be very extensive liver involvement,, extending for a considerable distance back from the gallbladder. One sometimes sees such extensive involvement that the liver substance may be largely replaced by scar tissue on the superior surface of the liver. Clinically this is manifest by increased tenderness on each side of the gallbladder.

We believe that this local hepatitis is secondary to gallbladder involvement instead of primary to it because (1) cholecystitis is not a regular accompaniment of diffuse hepatitis, and (2) the hepatitis improves with the removal of the gallbladder. The most extensive secondary hepatitis that I have seen was in a patient that I operated upon last year. She had had cholecystitis over a long period of years. The tenderness was so marked on either side of the gallbladder for several centimeters that inspiration could be stopped by holding the finger tightly against the liver margin. At operation there was an area on the superior surface extending about ten centimeters back of the liver notch, in which scar tissue entirely replaced the normal liver surface. Within three months after operation the liver tenderness had completely disappeared. This was interpreted to mean that the inflammation had cleared up. The scar tissue, however, probably will always remain.

## CONCLUSIONS

1. Primary hepatitis and cholecystitis may develop independently of each other.

2. Primary hepatitis is very frequently not accompanied by cholecystitis.

3. Primary cholecystitis is nearly always accompanied by a varying degree of secondary hepatitis.

4. Because of the frequency of secondary hepatitis, persistent cholecystitis even though mild should be operated upon early in order to prevent the development of liver changes.

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PAGET'S DISEASE OF NIPPLE. After reviewing three cases of Paget's disease of the nipple in which each affected breast presented a true intraduct carcinoma, Joseph Jordan Eller and Nelson Paul Anderson, New York (*Journal A. M. A.*, May 24, 1930), are of the opinion that Paget's disease of the nipple is a true cancer from the beginning; that the Paget cells found in the epidermis are true cancer cells, identical in appearance with the intraduct cancer cells. They are also inclined to believe that Paget's disease of the nipple is an epithelioma that has arisen in the first milk ducts near their mouths. Finally, they are strongly of the opinion that Paget's disease should never be considered a precancerous lesion but always a carcinoma of the nipple, symptomatic of a deeper carcinoma of the breast, and that early and total removal of the mammary gland is always indicated.

# CHOLECYSTOGRAPHY*

C. J. Johannesson, M.D.
WALLA WALLA, WASH.

Cholecystography during the past few years has proven a valuable aid in the diagnosis of gallbladder disease. From my own limited experience I believe that, when properly used in conjunction with a barium meal, it becomes a still greater value by showing the special relation of the gallbladder to the duodenum and hepatic flexure.

I do not expect to add any new information to this subject, which has been so thoroughly covered by workers of considerably more experience, but only to give a brief resume from my own observations in routine gallbladder and gastrointestinal studies, checked against surgical findings since 1925.

In my presentation before the American Roentgen Ray Society a couple of years ago, I stated that the oral administration in this combination had proven very satisfactory and reliable and I am still in favor of this method, because the majority of patients referred are ambulatory with indeterminate abdominal symptoms. The patients are very rarely hospitalized and can usually leave their regular occupation only long enough for the roentgen examination. Therefore, we sought to develop a gallbladder and gastrointestinal examination to fit our particular situation, which required the shortest possible time and still maintaining the greatest amount of accuracy.

Cholecystitis is one of our most common abdominal diseases. Because of its severity acute cholecystitis usually receives attention, while chronic cholecystitis is usually neglected for an indefinite time because of its insidious onset. The symptoms point more to gastric disturbances rather than that of gallbladder, so it often goes unsuspected by both the patient and the physician. Therefore, I am not able to state how frequently cholecystitis was the clinical diagnosis in my series of cases.

Improved methods of manufacture of the dye and constant research have improved the oral administration and we have learned to use smaller dosage at present of the tetraiodophenolphthalein. The mere elimination of the dye by the bile is not sufficiently satisfactory for visualization of the gallbladder, because this organ is not only a storage place for bile but also capable of concentrating it so that it becomes sufficiently opaque to cast a fairly dense shadow. To permit this concentration to occur it is necessary for the bile to remain in the gallbladder for quite a number of hours. Therefore, the gallbladder must be kept from emptying itself, which may be accomplished by not permitting any food to enter the stomach until after satisfactory films have been obtained at twelve or sixteen hours. After securing such satisfactory films of the gallbladder shadow a barium meal can be given without any disturbance or interference.

In our technic we secure films of the gallbladder shadows both on full inspiration and full expiration to be able better to study the contour of the shadow and determine excursion of the viscus. After this a barium meal is given for study of the stomach and duodenum. The patient returns four hours later for the sixteen-hour study of gallbladder and advancement of the barium meal. After this examination the patient is instructed to eat the so-called "fatty-meal" which in no way disturbes the barium meal, and return two hours later.

The almost prompt disappearance of the gallbladder shadow after a meal rich in fat is one of the criteria of a normal functionating gallbladder, namely, its contraction or emptying power. So is the diminution in size of the shadow and its increasing density during the time the dye remains in the gallbladder, which shows that the concentration power is still there, a function we find lost in chronic cholecystitis.

The exact mechanism of gallbladder emptying, in spite of intensive study, still remains an open question. One school believes the gallbladder empties a portion of its contents into the intestine as the result of periodic contractions of its muscula-

Fig. 1. Female, age 57, had clinical symptoms of cholecystitis. Roentgen study with dye demonstrated normal gallbladder, while barium meal study revealed a heavy band of adhesions across the colon as shown on colon radiogram. After bands of omental adhesions were released surgically all symptoms of cholecystitis disappeared and the patient has been feeling well since.

Fig. 2. Chronically inflamed gallbladder. Stone in common bile duct. Barium meal regurgitated into common duct. Operation confirmed cholecystitis, with stone the size of a pigeon egg in the common duct.

Fig. 3. Abnormal thickening of gallbladder; cholecystitis. No stones. Note the usual crescent-shaped pressure on duodenal bulb is here due to inferior pole of kidney. Cholecystectomy showed thick, tenacious bile present.

Fig. 4. Normal gallbladder shadow with normal response to tetraiodo salt located in relation to duodenal arch. On screen study normal function of duodenum was noted. Operation for removal of appendix confirmed the presence of a normal gallbladder.

Fig. 5. Long pendulous gallbladder demonstrating difference in position and relation to adjacent organs between full inspiration and expiration. Important in all cholecystographic study to make films at full inspiration and expiration, as well as to study the excursion of the gallbladder. a, on full inspiration, b, on full expiration.

Fig. 6. Strawberry gallbladder, suspicion of small calculi present. At operation a mulberry gallbadder was removed. Numerous small calculi present, adherent to wall of gallbladder.

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* Read before King County Medical Society, Seattle, Wash., April 7, 1930.

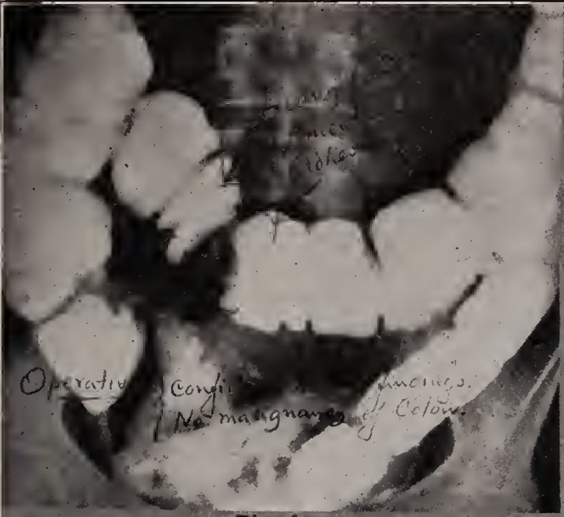


Fig. 1

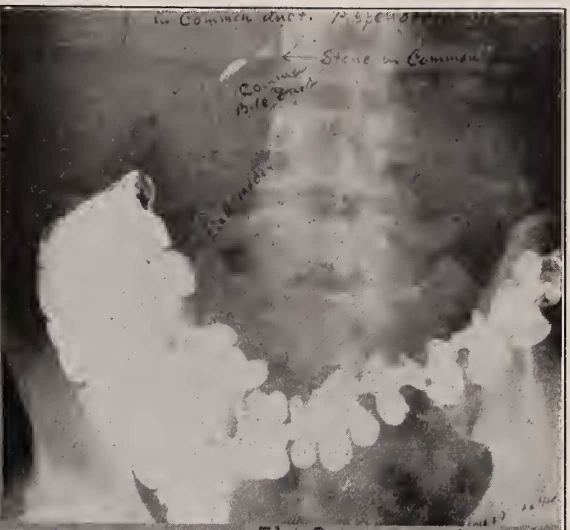


Fig. 2

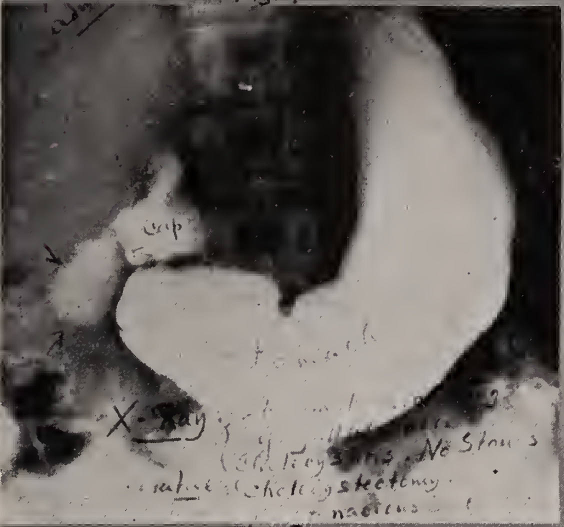


Fig. 3

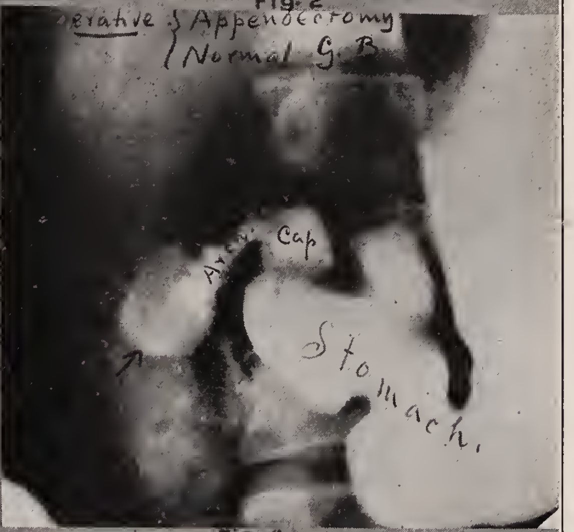
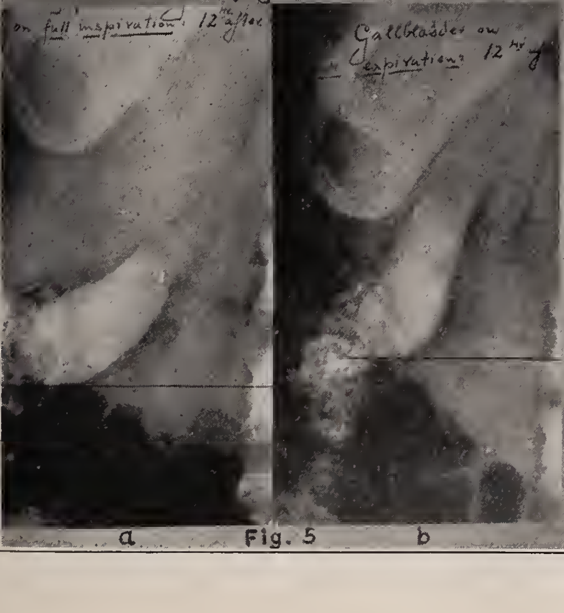


Fig. 4


on full inspiration 12 hr after
Gallbladder on expiration 12 hr

a Fig. 5 b

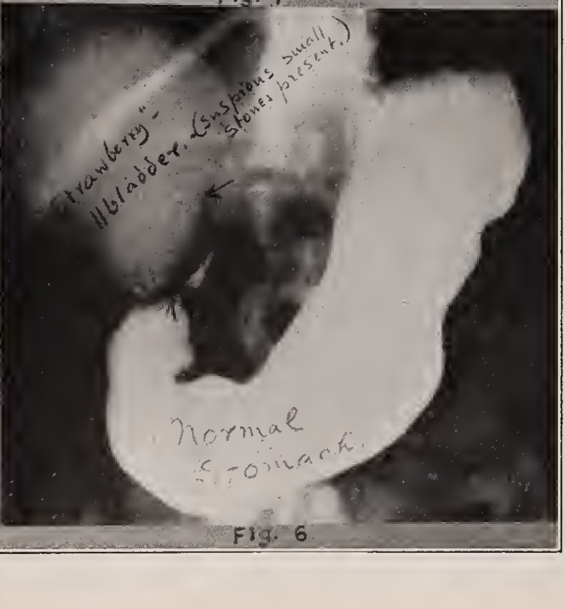

"Strawberry" Gallbladder. (Suspicious small stones present.)
Normal Stomach.

Fig. 6

ture; the other school holds that intrinsic contractions play but a minor role. Be it as it may, it has firmly established that lipoid substances are particularly effective in causing evacuation of the gallbladder. Therefore, the familiar use of cream, butter, egg, etc., the so-called "fatty meal," which is given for study of its contraction.

At this time I want to emphasize what is considered one of the most important factors in cholecystography. Technically perfect films must be obtained; a fixed technic must be adopted and adhered to, as well as careful dark-room work with fresh solutions. In all roentgen examinations, but more so in cholecystography, if one attempts to interpret films of inferior quality, he is sure sooner or later to serious mistaken interpretation, as this must follow more or less standardized criteria. Movement is one of the most annoying factors with which we have to contend, for the slightest movement or breathing on the part of the patient will often obscure the gallbladder shadow.

The density or faintness of the gallbladder shadow is still a point of dispute, faintness having been assumed to indicate impairment of function. This is not always true and we must take into consideration dysfunctions of the stomach, pylorus and duodenum in our interpretations. We often find on screen study intermittent regurgitation or other reflex disturbances in the duodenal arch associated with cholecystitis. We have also noted that we obtain just as good gallbladder shadows in the presence of duodenal ulcer as in other conditions.

The value of routine gallbladder and gastrointestinal study was of special interest in a female patient, age 57, who presented clinical symptoms of chronic cholecystitis. Roentgen study with dye visualized a normal functioning gallbladder; a reexamination revealed again a normal gallbladder and duodenum, while barium meal and barium clysma demonstrated a heavy band of adhesions across the colon, as shown on colon radiograph (fig. 1). After bands of omental adhesions were released surgically all symptoms of cholecystitis disappeared and the patient has been feeling well since (1927).

Case has suggested a convenient mode of classification which, if followed, would do much to correlate the results of various workers in cholecystography.

1. "Stone positive" refers to those cases, where the presence of stones is distinctly confirmed by cholecystography. If the stones contain much calcium they cast direct shadows; if composed of cholesterol they appear as "filling defects or negative stones" within the gallbladder shadow.

2. "Absence of shadow" or failure of gallbladder to concentrate, if confirmed by a repetition of the examination and duodenal dysfunction present, suggest marked disease of biliary tract. In this connection I wish to state that complete absence of gallbladder shadow without any recheck should always be looked upon as a failure of technic until proven otherwise.

3. A "normal" gallbladder gives within the standard time a definite sharply outlined shadow of normal contour, normal function of duodenum and good excursion between full inspiration and expiration. Furthermore, this type of gallbladder becomes almost free of bile two to three hours after ingestion of the fatty meal.

4. The "pathologic, noncalculous" group contains all cases not falling under one of the above headings. For instance, the shadow may be deficient in density or lack uniformity, producing pressure on duodenum, intermittent duodenal regurgitation or other reflex disturbances. Again, the picture may show a grossly deformed viscus, or the "golf-club" deformity. In this last analysis the value of any diagnostic method depends upon its accuracy and reliability and the interpreter's experience.

Various methods of oral administration have been or still are used. As a result of our studies I have found that the finer the precipitate the more of the dye is absorbed and the less is the laxative action. Therefore, the absorption of the dye from the bowel depends upon the degree of colloidality, which has been described by Fantus. During the past year with the use of the fairly stable colloidal tetraiodophenolphthalein we have obtained more uniform satisfactory results with less discomfort to the patient.

Criticism may be made that the barium meal can obscure the gallbladder shadow or biliary duct stones. I admit it would be true, if only one or two films were taken, but by a series of films before giving the barium meal and during the gastrointestinal series we have learned to overcome this disadvantage. While our methods and results may not compare with those in institutions or where time is not an important factor, they have proven satisfactory and reliable from our standpoint in the great majority of over 700 patients checked by surgery.

In conclusion I wish to repeat that cholecystitis is probably one of the most common causes of abdominal symptoms. Therefore, to be of greatest service the combination of cholecystography and gastrointestinal studies must be so carefully developed and performed as to make the test applicable to the routine patient. One should use the method and technic with which he is most familiar and stay with it. And finally, but not least, a close cooperation will result in mutual benefit, not alone to the patient but to the physician or surgeon and the roentgenologist.

## CHOLECYSTIC CYST OF THE ABDOMINAL WALL

Wayne J. Stater, M.D., F.A.C.S.
PORTLAND, ORE.

For several years I have had under observation a cyst of the abdominal wall which I believed to be a remnant of the gallbladder. At intervals the cyst became very tense, producing pain in the right upper quadrant. It was incised or tapped a number of times during this period. At first there were large amounts of bile pigment in the fluid which was thin in character and always contained a mucin-like substance. The coloration of the fluid became less marked but the mucin-like substance remained constant. No quantitative measurements of either the pigment or other contents of the fluid were made.

The patient had been advised to have the lesion removed and finally went to the hospital for this purpose, after harboring it for more than three years. The observation of the cyst and its contents has been very interesting. From its observation I conceived the idea of repeating similar experiments in animals. With this end in view I consulted Dr. George E. Burget and arrangements have been made to perform these experiments in his laboratory.

1 plan to repeat in animals just what occurred in this patient. A portion of the gallbladder will be transplanted into the abdominal wall by a two stage operation. During the first stage it will be freed from its attachments except those of the bile radicals and blood vessels, and the distal portion sutured into the abdominal wall. Later a segment of the gallbladder, about one-third of its distal portion, will be freed from the parent organ and its proximal end sutured and covered over with the parietal peritoneum. Before the segment is closed its contents will be evacuated and its mucosa lavaged with normal saline. The balance of the gallbladder will be removed.

In this way the secretions of the mucosa may be studied without any connection with the bile radicals and its original blood supply. The cyst obtained in this manner may be observed macroscopically through the skin and later microscopically by removing it. Its contents may be withdrawn at any desired interval for study and we plan to study any secretions of this isolated segment of the gallbladder carefully. Again, substances may be introduced into the organ and of particular interest will be the introduction of bile pigments and later study of the contents of the cyst. Any movement of this isolated segment may be observed by incising the skin at any time and the effects of mechanical, chemical, electrical, etc. stimuli may be observed and recorded in a suitable manner. We realize that absorption may not be normal, the lymphatics and nerve supply being interrupted.

The patient, aged thirty-two years, a waitress by occupation, first consulted me on account of a biliary sinus of seven months duration. Her maternal grandfather and grandmother died of cancer. One aunt died of cancer; otherwise the family history was negative. She was married and has one son who is living and well. One miscarriage. In the past she had had measles, mumps, chicken pox, scarlet fever, typhoid fever, diphtheria and tonsillitis.

Thirteen years ago an appendicectomy was performed. Three years ago a cholecystostomy was performed. Bile continued to drain for seven months following this operation and the patient's health gradually went down hill.

It was at this time that we first saw the patient, when a cholecystectomy and choledochostomy were performed, after which the chief complaint ceased and she rapidly improved in health, recovering normal weight and strength in a few weeks. There had been dyspnea and palpitation for years. During the period when the biliary sinus was present there had been edema of the ankles, nonproductive cough, distress after meals with nausea and vomiting. The menstrual periods had always been irregular. There had been a loss of twenty-five pounds in weight.

On examination at this time the blood pressure was 116 systolic, 82 diastolic. The only abnormalities found were in the abdomen, where there was a suprapubic midline incision, a right upper paramedian, and an oblique incision just below the right costal border. Along the course of the latter at about its midpoint there was a tender area, and a small mass, the size of a royal anne cherry, could be palpated. The right oblique upper abdominal incision had always been tender, but it was not until after a number of weeks following cholecystectomy and choledochostomy that a bunch was detected about its midpoint.

The urine was negative except for a faint trace of albumin in the noncatheterized specimen. Hemoglobin 85 per cent, w.b.c. 8,600. Wassermann negative. The gastric analysis showed absence of free HCl and a total of 37; otherwise negative. The stools contained bile.

Under local anesthesia this small lesion was removed. It was about 1 by 1½ cm. and contained fluid. It began at the peritoneum, rather a short distance anterior to this

Photomicrograph of gallbladder tissue excised from abdominal wall.

membrane, and extended outward through the abdominal wall to a point about one centimeter beneath the skin, surrounded by a thick layer of dense connective tissue. The microscopic examination of the specimen showed gallbladder tissue, surrounded by connective tissue.

In Joseph Caro's "Shulhan 'Aruch," which is the final and authoritative codification of Jewish law, there are nine rules or laws of terefah, pertaining to the gallbladder. In the first law there is a commentary by Zemah Zedek which is apropos to the case just reported. He states: "If the gallbladder protrudes through the ribs, and reaching the outside between the skin and flesh is yet found whole so that it becomes inflated when blown up, then it is kosher (fit for eating)." Boyden[1] states in this connection: "If it were not for the fact that in certain species the embryonic gallbladder is temporarily embedded in the ventral body wall, and if it were not for a suggestively similar anomaly found by the writer, in which the gallbladder of a cat embryo was left in the ventral wall by the rupture of the cystic duct, the dilemma recorded by Zemah Zedek might well be considered hypothetical."

The liver may grow forward into the sac of the normal physiologic umbilical hernia that exists from the fourth week to the fourth month in the human embryo. Ahfeld[2] has presented numerous reports of the presence of all or part of the liver (and thus the gallbladder) in the umbilical sac. Aschoff[3] presents cases in which the liver is primarily situated in this locus and not secondarily displaced by it.

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# A NEW BACTERIUM

Rex L. Ross, M.D.
YAKIMA, WASH.

The excuse for reporting this single case is that it involves the infection of men with an organism hitherto undescribed so far as I can ascertain and the development of clinical findings and progress of unusual interest. For reasons of brevity and to enhance interest the case will be reported actually as it appears in my case records.

D. A. R., male, white, age 19, native of Oregon, present occupation farmer. First seen March 13, 1929, complaining of pain in back and frequent urination for the past month. Typhoid at twelve years, no other previous serious illness. In the fall of 1928 had an attack similar to the present one with constant pain in the back and frequent urination which attack subsided after several weeks, since when he has felt fairly well until the trouble recurred in March, 1929. No history of heart or lung disturbance, appetite and digestion good, bowels move well every day without laxative, no hemorrhoids or history of bleeding by bowel. With the exception of the present trouble has had no symptoms referable to the urinary tract; denies venereal infection. At present must empty the bladder at least every hour and six or eight times during the night, no pain and no blood. For the past two years there has been a swelling developing in the right groin which has persisted and become progressively larger, which did not disappear or recede during the remission in symptoms during the winter. Weight 145 lbs. Lost 6 lbs. in the past month. Subsequent to primary history above recited it was disclosed that the boy had been working with stock, largely sheep, for the four years prior to engaging in orchard work which is the present occupation.

Physical examination March 13, 1929. A lethargic phlegmatic youth, fairly nourished, skin clear, rather pale for a farmer. Teeth excellent, tonsils scarred but show no present indication of infection; pharanx, thyroid, cervical glands normal. Lungs and heart clinically negative. Pulse 80, blood pressure 110/70. Liver barely palpable, of normal size and consistency; spleen not palpable. No physical evidence of intraabdominal disease. Some tenderness to percussion over the left kidney, reflexes normal. In the left groin is a large resilient mass, extending four inches below Poupart's ligament and deep into the abdomen above. Glands the size of hen's egg in the right groin; discrete, firm, elastic glands easily palpable in the tumor area. Penis and scrotum negative for signs of present or past disease.

Per rectum is an irregular mass palpable in all directions, obscuring all normal pelvic relations. By proctoscopic examination no bleeding and no evidence of involvement of mucous membrane. Roentgenogram of the pelvis was negative for pathology in the bony structure. Urine normal, Wassermann negative. Bloody fluid obtained by sterile puncture from the mass in the left inguinal region revealed an organism in direct smear and in culture, which has to date not been identified as a hitherto known disease producing organism.

It is thus described by Dr. A. W. R. Thiel: "Bacillus is gram-positive, with rounded ends; forms spores centrally, is definitely motile, tends to form chains, darkly pigmented. It grows as aerobe as well as anaerobe, preferably the former; grows on broth as a pellicle. On agar medusa-like colonies appear forty-eight hours aerobically, in five days anaerobically. Liquefies gelatin, ferments dextrose and saccharose without gas production; does not ferment lactose. The bacillus closely resembles bacillus gangrene emphysematosus, except th elatter is strictly anaerobic. It resembles less anthrax, but the ends of the bacillus are round and the motility rules out anthrax. The bacillus is not B. anthracoides, as the latter coagulates milk rapidly and our bacillus does not at all. Also B. anthracoides produces rapid hemolysis on blood agar and this bacillus only causes a very slight hemolysis.

"Guinea pigs and mice inoculated intraperitoneally died in from two to five days, and the germ was recovered in the blood. Cutaneous scratches inoculated with the bacillus produced a local abscess in guinea pigs, with general symptoms at the second week, the bacillus being recovered from the blood stream at death.

"The bacillus is entirely new and not anywhere described. It groups with the anthrax-black-leg group and has many things in common with both. The possibility mentioned by Schultz of Stanford that it might be B. anthracoides must be rejected, considering the characteristics of the bacillus in milk."

Cultures of the organism were forwarded by Dr. Thiel for examination to Dr. E. W. Schultz of Stanford who reported as follows:

"We have studied the organism carefully and must confess we are unable to place it definitely in any of the known species. It is a large pleomorphic, gram-positive rod, with slightly rounded ends. It forms spores slowly and these are for the most part centrally placed and do not give rise to distortion of the rod. It is an aerobe, growing in the form of pellicle on broth. On agar it gives rise to medusa-like colonies, resembling anthrax. The organism is pathogenic for mice and may be recovered from the blood following intraperitoneal inoculation. Filtrates of broth cultures do not appear to be susceptible. The organism may be B. anthracoides.

We shall send a culture to Prof. W. W. Ford, Dept. of Bacteriology School of Hygiene and Public Health, Johns Hopkins Univ., Baltimore, who is an authority on spore-bearing aerobes."

Dr. Schultz in turn sent cultures to Dr. W. W. Ford of Johns Hopkins whose report follows.

"The organism sent me by Dr. Schultz and originally isolated by yourself does not correspond to any of the aerobic spore-bearing organisms in my collection. It looks a little bit like bacillus mycoides but has brown pigment. I will check it up again and let you know if it can be identified more definitely."

With the idea of maintaining contact with the patient while studies were being made in an attempt to identify the organism, intravenous injections of mercury cyanide, gr. 1/6, were given every other day with remarkable and almost immediate improvement in the clinical symptoms, marked recession in the tumor in the groin and complete disappearance in ten days of the glands in the right groin. There was considerable delay in getting a definite report of the organism and in the meantime our primary improvement ceased and the inguinal glands again began to enlarge. There had been practically complete disappearance of the rectal findings during this first three weeks. Encouraged by the effect of the mercury and by the reported curative effect of salvarsan on anthrax, the drug was used in this case without improvement, likewise bismuth and anthrax serum.

An attempt was made to prepare a vaccine from the spore-bearing organism and as the technical difficulties were time consuming we in the meantime lost contact with the patient. An agressin was finally prepared as will be elsewhere described.

On July 7 the patient reappeared. On the advice of a neighbor he had used a preparation reputed to be snake oil, and this failing, had taken a mineral water treatment, also without therapeutic avail.

On his reappearance the boy was complaining greatly of a tight feeling in the chest, shortness of breath, unproductive cough and marked loss of weight. Examination of the chest revealed marked dullness in both bases with many fine, moist rales, corroborated by roentgenogram. The glands of the groin were less swollen than when first seen, there were no urinary symptoms. Weight 123 pounds.

The boy was at this time given his first dose of vaccine, a sample of blood was taken for culture and he was urged to collect a sample of sputum for analysis. The blood culture was positive for the original bacillus. On July 26 he reported much improved, cough less with no sputum. On July 28 the chest symptoms had completely disappeared, his general appearance was much better and he reported a feeling of well-being. August 5 he was practically symptom-free and had gained seven and one-half pounds in weight but from this time on the inguinal glands began to enlarge again and the primary urinary symptoms in mild form reappeared. Neosalvarsan was used in conjunction with our vaccine from then on but trace of the patient was again lost on August 12.

On September 3, in response to a letter requesting him to accompany me to the fall meeting of the North Pacific Society of Internal Medicine at Tacoma, the boy reappeared. He had been feeling well during the past three weeks and had been working in the orchard. He had been having considerable diarrhea and urinary frequency at night only but made no complaint of that. The throat and mouth were negative, the lungs clear clinically and fluoroscopically, no cough or dyspnea, thyroid negative, heart negative, abdomen full and tense, umbilicus protruded slightly, no enlarged veins, no fluid demonstrable, no tenderness, no demonstrable adenitis except left inguinal region, where less marked, and slight enlargement in right groin. T. 98.4,° p. 78, w.b.c. 4,800, r.b.c. 4,580,000.

It was sugested that the patient attach himself to a college hospital, where he might obtain help from the careful study and therapeutic attempts the unusual features of his case would arouse, but this he refused to do and I again lost touch with him Sept. 18.

On December 13 he reappeared. He had felt quite well until the past month, had gained weight to 140 pounds, still had diarrhea with ten movements in twenty-four hours which could be checked for two or three days by castor oil. During the past month had been developing many skin lesions in the form of ulcers one-half inch in diameter, general over the entire body, face and extremities, hundreds of them. Each ulcer was in appearance a miniature anthrax lesion, with black hard central crust, raised hard undermined edges, pus and serum exuding on pressure. Material from these ulcers on culture gave the original organism which had been grown from glandular extract and blood with the previous characteristics intact. The primary culture was contaminated with staphylococcus. The inguinal gland mass was greatly reduced in size, discrete elastic glands the size of a marble still being palpable, however. He was at this time put on a smooth diet with kaolin and iron cacodylate gr. one-half, intramuscularly.

On December 24 the skin lesions had cleared rapidly, being practically all gone, leaving a soft, smooth, scaly, dull red scar. Still he had some dysentery, weight varying greatly within short intervals, losing or gaining four to ten pounds in the course of a few days. This probably was explained by a variation in ascites which was becoming increasingly noticeable, being more marked when the diarrhea was less and vice versa. Liver and spleen normal size and consistency to palpation not tender. Complained of some loss of appetite.

Jan. 21, 1930. Skin practically clear, dysentery controlled but distinct increase in ascites. Felt well but was now developing a marked left cervical adenitis similar to the original mass in the left groin. Fluoroscopic examination of the chest showed sharply outlined shadows, two and one-half inches in circumference in each hilum; no pulmonary symptoms. The iron cacodylate was stopped and agressin, originally developed, was again used. To this time the patient had been ambulatory, was able to do and had been doing a reasonable amount of work on his father's farm and resented the idea of hospitalization.

Jan. 28. His brother reported the development of abdominal complications three days after the last office visit, much abdominal distention and distress with tenesmus and small liquid stools which were daily becoming more pronounced. Hospitalization was insisted upon and after two days delay he was removed to Saint Elizabeth's Hospital.

The glandular enlargement in the neck was at this time so reduced as to be barely palpable. The white count on admission was 10,800, small lymph. 11, large lymph. 6, polys. 83. Urine normal. The abdomen was greatly distended and tympanitic, with fluid in the flanks; he was suffering intensely. Examination of the chest was clinically negative, pulse 118, of good quality, no indication of circulatory embarrassment. Bp. 110/70.

For various reasons surgical interference was deemed inadvisable by consultants. During entire hospital course temperature was subnormal. Two days after admission circulatory failure rapidly ensued with intense cyanosis. He died with evidence of overwhelming toxemia and circulatory failure on Jan. 30.

A partial autopsy on the abdomen only was obtainable. The report by Dr. Shirley follows: The body is of adult male, appears emaciated, with distended abdomen and distinct left inguinal mass. Body was opened by Dr. Ross with median abdominal incision, showing the peritoneal cavity filled with pus and fluid exudate. Bowel and small intestine adhered to peritoneal wall and loops adhered to each other. Liver was enlarged, smooth, grey in color and very friable. Spleen was enlarged and friable and kidneys appeared normal in size and somewhat firm. Stomach, colon and bowel were adhered together and showed usual changes of acute peritonitis. No retroperitoneal glands were found and body was closed without further exploration. Diagnosis, septicemia with general peritonitis.

Microscopic report: Liver shows marked fatty degeneration of the parenchyma cells with many interlobular areas of round cell infiltration. The interlobular connective tissue is somewhat increased and the blood vessels show peri-infiltration with round cells in some places. Rod bacilli were stained in the liver section. Retroperitoneal fat shows nothing of interest above that seen in the liver section.

In retrospect it seems regrettable that a more thorough attempt was not made, when the opportunity offered, to substantiate the probability that the terminal event was due to a perforated lesion of the intestine with secondary mixed infection of the peritoneum. Any criticisms will be accepted with due humility. The difficulties at the time seemed insurmountable and the need of corroboration slight.

Of added interest was the attempt by Dr. Thiel shortly before the fatal termination to develop an immune serum from a goat which succumbed in eight days with a bacteremia. The organism was recovered from the blood. An attempt was made after questioning, which developed suggestive connection, to work out possible animal source of this infection of the patient but the attempt has to date been unsuccessful.

This case should be of interest for various reasons. The bacterium could not be classified other than generally, its resemblance in morphology to anthrax and the resemblance of the skin lesions to those from infection with that organism. The high degree of immunity in the patient was noted or low pathogenicity with high pathogenicity for animals. There was a peculiar response of the patient for considerable intervals to various therapeutic attempts.

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BONE-GRAFT OPERATION FOR TUBERCULOSIS OF SPINE. Fred H. Albee, New York (*Journal A. M. A.*, May 10, 1930) reviews and summarizes his experiences in the treatment of 856 cases. In only 6 per cent was the observation period less than one year; in 63 per cent it was from one to five years, and in 31 per cent it was from five to nineteen years. Preoperative complications were present in 286 cases (33 per cent). About half of these were abscesses or sinuses in various regions. In 32 per cent there were symptoms and signs of pressure on the cord, which had usually progressed to paraplegia or other forms of paralysis. Tuberculosis of the lungs or of other joints was present in 16 per cent. In one case a spinal graft, inlaid by another surgeon, had fractured. In 90 per cent of the cases the result was classified as excellent or good. In many of these the patient told of doing such hard work as heavy lifting and scrubbing, or of indulging in riding, tennis and swimming. In a few there were mild complaints of fatigue after the day's work or of occasional distress in the back. In the cases classed as good, there was still some mild reminder of the disease but there was no noteworthy incapacity. In the cases in which the patient was as strong and active as if he had never been ill, the result was classed as excellent. In sixty-nine cases, 8 per cent, the result was classed as fair, since the patient complained of moderate pain at times or was not able to do more than light work or indulge in active exercises without restrictions. Seventeen patients died, three of them during convalescence.

# DENTAL PATHOLOGY IN RELATION TO DISEASES OF THE EYES, EARS AND NOSE*

C. A. Veasey, Jr., M.D.
SPOKANE, WASH.

The literature relative to focal infections is voluminous, and to summarize what has been written even in the restricted fields of ophthalmology, otology and rhinology would require a volume of no mean proportions. The following remarks must be, therefore, somewhat sketchy. My purpose is not didactic, and if this paper serves only to emphasize the importance of understanding and cooperation between the two branches of the art of healing represented at this meeting, its purpose shall have been accomplished.

The subject is an ancient one, but it is only in comparatively recent years that it has assumed the position of clinical importance which it helds today. In one of the medical journals a few years ago[1] there is the following remark by Blair: "I cannot quote the source or date, but 2,500 years ago someone told one of the old kings and left it on stone tablets, that the pain in his back, in his head and in his feet was due to his teeth and he would not get well until his teeth were extracted." The fruit of such clinical acumen was lost during the middle ages, but Rush[2] in 1818, wrote, "I have been made happy by discovering that I have only added to the observations of other physicians by pointing out a connection between the extraction of decayed and diseased teeth and the cure of general diseases."

Hunter[2] first introduced the term oral sepsis in 1900, and Billings, in the Lane Medical Lectures of 1917, put this subject on a firm basis. The tonsils, accessory nasal sinuses, intestinal tract, particularly the appendix, the gallbladder, the male and female urogenital systems and even osteomyelitis of the extremities all play their role in causing inflammation of the various organs of the head, but the teeth are in the front line of this army of human enemies, and we will confine our attention to them.

I am not familiar with dental pathology, and the exact diagnosis of the condition of an offending tooth must be left to the dentists, but there is no choice from our standpoint so long as the presence of absorbable infection is established. The modus operandi of focal infection is still controversial. Rosenow has established selective affinity of certain strains of streptococci for certain tissues; others believe that reduced vitality on the part of certain organs makes them vulnerable to bacteria or bacterial toxins which may be present. When the removal of the primary lesion causes a subsidence of the secondary inflammation, it seems unreasonable to assume the presence of living organisms in the latter. The mode of transmission may be by blood, lymph or direct extension, and we have also to consider the effects of reflex pain along associated nerve paths.

There has been described a general clinical picture of focal infection[3] as follows: Low grade anemia, slight leucopenia with relative lymphocytosis and low neutrophile count, low blood pressure, slow pulse, low basal metabolism, subnormal temperature and a low blood calcium content. A special blood cell, pathognomonic of dental infection, has been described by Toren, but the staining methods are difficult and his observations have not been widely confirmed or accepted.

This picture is not of much help clinically, nor must we expect subjective symptoms on the part of the patient to point the way, as infected teeth are notoriously silent offenders. The roentgenogram is of inestimable value, but not infallible, and even vital teeth have been found harboring the streptococci which these dental foci almost always contain.[4] So it is sometimes necessary, in the face of apparently negative findings, to push our investigations to the limit when a possible dental infection may be responsible for rapidly advancing blindness or deafness. Nor does the mere extraction of a tooth suffice, if there be much bony necrosis, and retained roots and bony sequestra are as guilty as the original tooth. So a healthy appearance of the teeth is not significant, and a negative roentgenogram is not final. Stubborn cases require painstaking dental examination, general physical examination and laboratory tests to eliminate other possible factors, and consultation between the doctors and dentists is essential to the ultimate health of the patient.

It would be out of place to enumerate here the long list of ocular defects which may result from dental infection, but let us consider in a general way the etiology of eye diseases. Acute or chronic inflammations of the uveal tract, comprising the iris, ciliary body and choroid, polymorphous opacities of the cornea accompanied by inflammatory symptoms of widely varying degree, hemorrhages and exudates in the retina, disintegration of the vitreous with the formation of floating opacities, hemorrhages into the vitreous in young persons,[5] optic neuritis[6] and consequent atrophy, macular degeneration and certain intrinsic motor anomalies of the pupil and accommodation[7] may be said in gento be due to syphilis, tuberculosis, nephritis, diabetes, arteriosclerosis and focal infection, among other less frequent causes. Some enthusiastic observers include cataracts and glaucoma in the list of ocular diseases due to remote infection, and although this cannot be categorically denied, it has not been proven.

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* Read before a joint meeting of Washington State Dental Association and Spokane County Medical Society, Spokane, Wash., Mar. 13, 1930.

Some of these conditions will by their appearance give prima facie evidence of the etiology, as, for example, the interstitial keratitis of congenital lues, tubercle of the choroid or albuminuric retinitis, but in the greater number of cases the various possible causes must be investigated and even put to a therapeutic test before the sequence of cause and effect is clear. The absence of definite clinical or serologic evidence of syphilis, a negative tuberculin test if it has not been contraindicated, and negative urinalysis and blood chemistry lead us to the necessity of finding an occult focus to explain the lesion. However, we do not await a negative report on the above tests, but at the first examination inspect the teeth, squeeze and possibly culture the tonsils, and examine the nasal sinuses, supplementing these findings with sinus and dental roentgenograms, and referring the patient to his dentist for careful evaluation of the dental evidence. One writer has said:[6]

> "Of late the teeth have furnished the foci in so many cases that it is really a great disappointment when a patient comes who has lost all his teeth or with teeth so healthy that there is little hope of finding the trouble there."

By now the mystery may have been solved. The Wassermann may be positive or there may be obvious apical abscesses, and the treatment consequently self-evident. But a positive Wassermann does not necessarily mean that the eye lesion under treatment is luetic, and I wish to state emphatically that an iritis, for example, in a luetic individual may be due to dental or other infection. This was most strongly brought to my attention a few years ago in the case of a young man with a severe iritis and a four plus Wassermann. Vigorous antiluetic treatment failed to modify the inflammation, and removal of a pair of tonsils containing liquid pus gave only temporary remission. Not until seven abscessed or suspected teeth were extracted did the eye recover.

In this connection let us quote White[6] in the *Annals of Otology* two years ago:

> "Apical abscesses are only one of several factors in dental infection. The pulp and the dentine both harbor microorganisms not always evident in a roentgenographic film, yet capable of producing most serious systemic infection . . . The point I wish to stress is that dental films do not tell the whole story. . . 'It is significant in the extreme to note that thousands of teeth that are symptom-free, and that are roentgenographically negative, are being examined in the bacteriologic laboratory after extraction and found to be infected. In view of this, we are eminently justified in viewing all pulpless teeth with grave suspicion'."

So it happens that the ophthalmologist, despairing of his patient's eyesight, importunes the reluctant dentist to extract teeth not certainly diseased but not unequivocally sound.

Detrimental ocular reactions have been reported after the removal of all the offending teeth at once. We have, however, frequently had six or seven abscessed teeth removed at one time without noting undue reaction. In some instances it is more advisable to remove the source of infection by serial extractions. However, in a uveitis, for example, throwing out exudate in the pupil and forming deposits on the posterior surface of the cornea leading to permanent loss of vision, the longer the inflammation remains, the greater will be the damage. Thus, the prolongation of the disease while serial extractions are effected will in some cases be more detrimental than the one severe local reaction following the complete removal of the offending teeth.

Dental infection plays an important role in the occasional disastrous results of intraocular surgery. In the presence of apical abscesses or other foci of infection an operation such as cataract extraction, performed without any surgical accident or other unusual occurrence, may result in a prolonged uveitis eventuating in total blindness or loss of the globe. The surgical trauma precipitates a metastatic endogenous infection which may not yield to the most vigorous treatment. In preparing patients for intraocular surgery it is, therefore, necessary to remove existing foci to eliminate this hazard. Thorougness is good, but extreme radicalism as practised by one ophthalmologist has its humorous sequellae. Because of his insistence, in preparing his cataract patients for operation, on extraction of teeth, tonsillectomy and a rigid green vegetable diet to remove the respective dangers of teeth, tonsils and intestinal toxemia, his surgical clinic dwindled to almost nil, as the patients grew restive under a protracted regimen of edentulous lettuce nibbling.

The role of dental infection in otology is less prominent than in diseases of the eye, but there are some conditions where it must not be overlooked. Just as any neuritis may be caused by an occult focus, so also can inflammation of the auditory nerve be so determined. There is no known treatment for nerve deafness and atrophic nerve fibres do not regenerate. Prevention of increase of the trouble is all that can be hoped for, and it is imperative to remove possible causes as soon as the condition is recognized.

Likewise, in otosclerosis, which is the hereditary or familiar form of deafness, there is no efficacious treatment. But it is generally conceded that maintenance of the best possible general health delays the progress of the disease. Certainly, then, it is essential to remove dental infection, if it be present, especially as one can not always be certain that apical abscesses are not directly the cause of part of the auditory impairment in any given case.

There is one aural condition directly dependent upon focal infection, usually dental, which responds to removal of the cause in a very satisfactory manner. The patients complain of recurrent attacks of vertigo and deafness which is usually but not always unilateral. The attacks are variable in duration, last over a period of months or years if not treated, and are sufficiently severe to cause real incapacity. The vertigo is always an organized turning indicative of its labyrinthine origin, and the deafness is of the nerve type. Rotation, caloric or galvanic vestibular tests show impairment of function of one or both labyrinths. This syndrome yields to removal of the foci with subsidence of the subjective symptoms and amelioration in the physical findings, so that it has been justly called "focal infection neurolabyrinthitis."[8, 2]

It would not be proper to leave the ear without mentioning impacted third molars. A long list of reflex disorders has been laid at the door of these silent offenders, but as mastoids have actually been operated upon because of reflex otologia from this source, they must not be forgotten. It has been reported that some cases of chronic purulent otitis media have cleared after the removal of infected wisdom teeth, but such a result is so rare as to be almost in the realm of coincidence.

In the nose we need only call attention to the infected bicuspid or molar which may be responsible for a stubborn maxillary sinusitis. Skillern[12] places the incidence of antrum infection from teeth at twenty per cent, but calls attention to instances where this is the primary disease with the alveolar trouble secondary to it. In this connection I want to bring up two conditions which simulate sinusitis.

A woman came in the office a few years ago, stating she had antrum trouble. Her face over the superior maxilla was swollen, red and tender on pressure, but the antrum on irrigation yielded a clear return. Inspection of the mouth showed that the inflammation was present also in the gum with a point of greatest tenderness along the gingivobuccal fold. After extraction of several badly diseased teeth in that part of the jaw and incision and drainage of the abscess, the condition rapidly cleared.

The other condition occurs in infants and is described as follows[9]:

> "A newly born or a young infant suddenly becomes ill with fever and prostration and shows a swelling and redness about the tissues of one eye. This is followed or is accompanied by purulent unilateral discharge, by swelling and softening of the alveolar border of the superior maxilla on the affected side and by pointing and the formation of abscesses on the hard palate, the alveolar border and often on the face between the eye and the nose. Sequestrums and frequently small teeth are discharged from these sinuses."

From this description it may be readily seen that cellulitis of the orbit, acute dacryocystitis or acute antrum infection might be suspected. But the antrum in these children has a capacity of less than one cubic centimeter and the abscess cavity on surgical exploration is much larger and does not communicate with the antrum. The disease is an acute osteomyelitis, resulting from infection in the teeth buds and, if the patient recover, there are never any upper teeth on the affected side. The condition is fortunately rare, but as the mortality is about fifty per cent and the diagnosis easily missed, it is important to keep in mind.

Pain in the distribution of the fifth cranial nerve is so frequent in the practice of both dentists and eye and ear specialists that a few words on this subject are in order. Typical tic douloureux is characterized by a series of short, sharp, stabbing, lightning pains, agonizing in severity, coming on in paroxysms, increasing in severity and frequency as time goes on, with periods of remission sometimes lasting years, usually beginning in one branch of the fifth and later spreading to others, with the existence of "trigger areas," the slightest touch of which precipitates a paroxysm, the patient being afraid to chew, wash his face, clean his teeth, etc., as such acts often initiate an attack. This disease, according to Patrick,[10] is not due to any systemic intoxication or infection, syphilis, malposed teeth or any focus of infection, has no known etiology or pathology, and yields to no treatment other than surgery of the nerve. (Adson says it is due to arteriosclerosis, and Spiller assigns it to sclerosis of the gasserian ganglion.) This author, moreover, states that any dull pain, steady ache, sense of pressure, fullness or tension is not tic douloureux.

This latter type of fifth nerve pain Smith[11] calls symptomatic or atypical trigeminal neuralgia. It is frequently due to carious, impacted or malposed teeth, apical abscesses or other foci of infection about the head, and is amenable to removal of the cause. It is important, therefore, to keep these two types clearly differentiated so that in the first instance the patient will not be subjected to useless procedure, while in the second he may be relieved of his symptoms.

In any branch of medical practice the general aspects of a case must not be lost in this day of narrow specialization. I have seen convalescence after mastoidectomy arrested because of poor general health due to execrable teeth, and healing and return of strength occur only after total extraction. Stubborn cases of headache, at first thought to be due to eye strain and then to nasal obstruction, have yielded after removal of foci of infection. So it behooves all of us, the dentist, the general physician and the various specialists, to work in mutual confidence and harmony, realizing that in a given instance we are not treating teeth, tonsils or intestines individually, but that the afflicted human organism as an integer requires our collective services.

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1569 Paulsen Medical and Dental Building.

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**Effect of Liquid Gasoline on Pulmonary Tissue.** J. C. S. Battley, Port Huron, Mich. (*Journal A. M. A.*, May 17, 1930), reports a case of pneumonia following the accidental aspiration of gasoline into the lungs. The patient, a boy, aged 8, had suffered from pneumonia four times, having had an attack before one year of age, one at one and one-half years following whooping cough, one at two and one at 3 years.

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# MATERMORTALITY *

William F. Howard, A.B., M.D., F.A.C.S.
POCATELLO, IDA.

The continued reiteration of the statement that there is no decrease in mortality and morbidity in obstetrics is a constant challenge to the general practitioner. We repeatedly see this statement together with statistics to prove it. There are so many factors that enter into the statistics that it is with the utmost difficulty that they may be applied to the general practice in any locality. We all know physicians who care for maternity cases occurring in a general practice, having in a number of years cases running into hundreds and thousands with no deaths or a very low mortality, all of which can be accounted for outside of the experience of labor, according to their statements and beliefs.

But these statements and beliefs are usually without records, and thus lack more or less a dependable foundation. The literature on this subject comes mostly from specialists and teachers, but most of the births are under the care of general practitioners or even without medical attendance. The former of these are trained to record and report maternal deaths to the best of their ability and the latter, through a desire to escape responsibility, too often give other than puerperal causes of maternal deaths.

It is my purpose in this paper to review available statistics in my locality, with a summary from the State Board of Health, to compare these with statistics of larger and older institutions, and finally to discuss some of these causes of death in the puerperium and the treatment of conditions most commonly causing death of the mother in confinement, pointing out a way to improve matermortality reports.

Mayes of the Presbyterian Hospital, Brooklyn, states that, "during the last seventy-five years the mortality and morbidity from childbirth have remained the same; they are just as high today as they were before the day of Pasteur and Lister and the discovery of antiseptics." However, in the same paper Mayes gives the mortality from puerperal septicemia in Greater New York 1923, 0.89; 1924, 0.99; 1925, 1.07; and states that these figures must be too low because of the many cases incorrectly reported as dying from pneumonia, cardiac dilation and various other causes, when the real cause was puerperal sepsis.

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* Read before the Thirty-Seventh Annual Meeting of Idaho State Medical Association, Lewiston, Ida., July 5-6, 1929.

Rosensohn reports, 1924, in the Lying-in Hospital a matermortality of 0.4, a figure less than half that of the Presbyterian, a variation not incompatible with reports of the same hospitals in different years. The Lying-in Hospital report is, however, for all causes of death during labor and the puerperium and the former for septicemia only.

Dublin mentions the maternal death rate in the United States 8 per thousand, in New York City 5 per thousand, England and Wales 4.2 per thousand. Kickham, St. Elizabeth's Hospital, reports 5 per thousand. Emerson gives in 1,974 cases in physicians' families 9 maternal deaths or at the rate of 4.6 per thousand. The Prenatal Clinic in Detroit gives 3.1 deaths in a thousand and the entire city of Detroit 6.8 per thousand. A bulletin from the Department of Commerce at Washington shows ten states, 1915, from a registration area having a matermortality of 6.4 per thousand, of thirty states, 1925, ranging from 5 in Utah, to 9.7 in South Carolina. Madill in the Rotunda hospital gives a review of the past thirty-six years in obstetrics in that institution, where the mortality of mothers in labor and the puerperium ranges from 1 to 19 annually with a total average of 1500 patients a year, and the average matermortality of 4.2 per thousand.

For a moment limiting our discussion to puerperal infection, DeLee estimates an annual death rate of 8000 in the United States without giving figures so a percentage rate could be determined. In 1924 he gives the average rate from septicemia in Ireland 0.327 per cent, Glasgow, 0.57 per cent, Germany 6000 deaths. Then follow some more encouraging statistics. Von Herff reported 6000 deliveries in Basl with no death from sepsis; Ahlfeld reported 8000 cases with one death from sepsis; Rotunda Hospital, 1924, 2060 confinements with no death from sepsis; New York Lying-in Hospital 8373 deliveries with no mortalities from infection. The Chicago Lying-in Hospital 14,146 cases with three deaths from infection acquired in the hospital. He cites these 38,560 with four deaths from infection as a stunning argument against autoinfection. There can be no doubt that, if we fail to account for infection, the excuse for autoinfections is readily acceptable. The Chicago Lying-in Hospital has a record of 3900 consecutive cases without a death from any cause.

These reports and those from many other hospitals show that there is a lower maternal death rate in hospitals than in homes. With this low maternal death rate some of the patients were brought into the hospitals approaching the final condition. A statement is made by Hiffin, Pasadena, that there were no deaths for the period reported by him in the homes, but the patients who were dangerously sick were taken to the hospital where some of them died.

It is easy to find astonishing evidence to question the statement of Mayes in regard to maternal deaths. The textbooks are full of evidence that septicemia was common and the death rate from it appalling until the practice of antiseptic midwifery became common. There is reference to puerperal sepsis far back in history, from Hippocrates, Galen, Celcus and various writings down to the time of more definite records. The first authentic epidemic of septicemia occurred in Leipzig, 1652-1665. In 1662 it reached Paris and two-thirds of the women delivered in hospitals died. There were epidemics in London, Edinburgh, Berlin and many other parts of Europe. Even in 1831 the mortality was 9 per cent or 90 in one thousand in the Paris Maternite. In Vienna in 1842 the rate varied with the months from 18 to 31 per cent, or 180 to 310 per thousand. It is true that these figures of high mortality came from hospitals before any knowledge of antiseptics was practiced or even known, and that students examined consecutive cases without disinfection between examinations.

We have no definite data as to the mortality in private practice but the general inference is that it was much less than in hospitals. In private practice the transference of infection was at least not so immediate. So at least we would conclude from the published data that the matermortality is much less now than previous to the time of Lister and Pasteur. Even in current fiction the heroine no longer dies at the birth of her first born. While history and our recent records give us favorable conclusions, we must recognize there are too many mothers sacrificed by the lack of preparation for the unusual, and lack of a sepsis and antiseptics in the regular cases. This requires a constant readiness for the unexpected, a constant fight against sepsis in every case, as well as continued prenatal study.

If the general maternal death rate in the United States is 8 to 1000 (Dublin), as we may assume, with some allowances, that the general practitioner the country over has about that mortality in his obstetric practice, and from personal experience and a limited acquaintance one can assume that the general practitioner may attend from 50 to 100 cases in a year. On the average, then, this same practitioner could expect one death in 125 cases numerically and one death in 15 to 30 months elapsed time. This rare occurrence and length of time with no mortality leads him to believe that he has a small matermortality and tempts him to account for the deaths from some other cause. This assurance allows him to lapse in vigilance. This is certainly a factor in the low mortality reports from sparsely populated states. If the specialist can improve his care and technic it is well, but the general practitioner must improve his obstetrics.

Replies from about one-half of personal letters to all physicians attending confinements in my locality give a total practice of 294 years with 13,954 confinements and 69 maternal deaths, a rate of .489 per cent (4.89:1000). One small hospital reports for a period of five years 719 obstetric cases with 8 deaths, a rate of .898 per cent (8.98:1000) and mentions the causes of death for the 8 cases to be cardiac 3, cardiorenal 1, eclampsia 1, pneumonia 2, pulmonary edema 1. The doctors of my city, ranging in this time from 5000 population to 22,000, report a matermortality of .38 per cent (3.8:1000). My state reports for the last five years available 50,750 cases with 341 maternal deaths, a rate of .670 per cent (6.70:1000).

Thus we find it very common that reports of work done under the best surroundings show a matermortality of 4 to 5 or 6 per thousand, and some institutions running high in the thousands with no deaths of mothers. The general estimate in the United States is 8 per thousand (Dublin), my city 3.8, my locality 4.89, my neighboring state 5, my state 6.70. Personal experience, acquaintance and observation show that these lowest figures outside of institutions and with few records and inadequate supervision cannot be considered dependable. And here, again, we realize that the improvement to be made in saving maternal life rests with the general practitioner.

There is too wide a divergence of expression for one to attempt to specify the frequency of the unusual and accidental conditions of obstetrics, and only six causes of death will here be considered. They are the six causes discussed by Madill of the Rotunda Hospital. These certainly offer a basis for improved returns in the hands of the general practitioner. They are (1) sepsis, (2) placenta previa, (3) accidental hemorrhage, (4) postpartum hemorrhage, (5) contracted pelvis, (6) eclampsia.

### TREATMENT

The prevention of sepsis is a rigid observance of the aseptic technic from as early a time as indicated until the end of the puerperium. This is not sufficiently practiced generally, as evidenced by a frequent morbidity that is always potentially dangerous. Our mild infections recover and we soon decide that the patient was not septic. We forget our morbidity statistics. Ward of the Woman's Hospital uses the picric acid technic, Mayes the mercurochrome, and there is an increased certainty in an ocular chromatic technic, especially when their statistics are so nearly free from morbidity and mortality.

For the remaining five common causes of mortality I shall quote only the treatment used in the Rotunda Hospital and leave it to the discussion to bring out other methods which we must recognize as good. I am quoting the treatment outlined in the Rotunda Hospital because of their excellent work, honest reports and very low mortality, due to good management of scientific work.

*Placenta previa.* Perform version and leave to nature. Cesarean section in primipara at term before hemorrhage has occurred. It is rarely practiced with women who have passed one or more labors, and not advised in any case in which there has been a considerable hemorrhage.

*Accidental hemorrhage,* or abruptio placentae, is divided into two classes, concealed and external. Some further division may be made. For concealed hemorrhage the radical operation is advised. For all other forms thorough vaginal packing has proved at the Rotunda to be the best method of treatment.

*Postpartum hemorrhage* is treated much the same the world over: massage of fundus, manual exploration, ergot, pituitrin, tamponade, in extreme cases ligation per vagina. A period has been reached in which postpartum mortality approaches nil.

*Contracted pelvis.* There is a considerable divergence of opinions concerning treatment of this condition. I quote directly from Madill of the Rotunda Hospital, as given in the *Irish Journal of the Medical Sciences, February,* 1927.

1. Induction of premature labor is never advisable.

2. Perforation (craniotomy) is not permissible unless the child is dead.

3. Version should never be employed.

4. In the greater degrees of contraction time should never be wasted in an endeavor to obtain natural delivery.

5. On the other hand, in the lesser degrees ample time should be given the woman to enable her to deliver herself if possible. Eight or ten hours may be necessary for the molding of the head and interference should not be considered until there is evidence of fetal or maternal distress; then there should be no delay in delivery. Walcher's position should not be forgotten as an aid to fixation of the head.

6. High forceps should never be applied until all arrangements are perfected for an operation to enlarge the pelvis. Madill does not give relative measurements as an indication for cesarean section. He accepts no measurements as dependable, except those taken under anesthesia by the Skutch method.

An average year shows in the Rotunda 26 cases of greater degree contracted pelvis treated as follows: 13 cesarean sections, 3 pubiotomies, 2 inductions, 3 versions, 5 craniotomies. Cesarean section is the master operation and is the only one for the greatest degree of contractions. It requires more knowledge and experience to decide to do the other operations, with the possible exception of craniotomy in the case of a dead baby.

*Eclampsia.* The Rotunda treatment of this disease consists in rigid adherence to many points of detail as here outlined.

"The patient is kept on her side to prevent the fluids formed in the mouth from reaching the lungs by inspiration. For the same reason croton oil or other forms of medicine or fluid is not permitted to be placed in the mouth of the unconscious patient. I feel convinced that the so-called edema of the lungs which is said to close the existence of so many eclamptics results in reality from such mistaken methods of treatment.

"Neither a vapor bath, pilocarpine nor other forms of diaphoretic is administered, for the advantage derived from all and each seems very problematical and is certainly more than counterbalanced by other objectionable effects.

"We pass a stomach tube through the mouth. The stomach is thoroughly washed out. Into the stomach is then poured by means of a tube a quart of slightly saline hot water, together with castor oil, elaterin, croton oil in four or five drop doses, or some saline purgative.

"Whilst these preparations are being perfected a hypodermic of morphine in a half-grain dose is injected; this drug is repeated in one-quarter grain doses every two hours until the fits cease or until one grain has been administered. It is occasionally necessary to continue the administration of the drug, but on no account should a greater dosage than two grains be given in twenty-four hours.

"We attach enormous importance to the thorough and rapid evacuation of the bowels, and the purgatives are stimulated in their action by administration of copious enemata of soap and water with castor oil. Saline enemata are also given.

"In severe cases normal saline to the amount of two or three pints is infused once or oftener into the cellular tissue beneath the mammary glands. Labor is never induced nor is its onset to be desired. Should it unfortunately occur, its progress is seldom interfered with.

"Some patients have died in the eclamptic fit. This should never occur. Death is then caused by suffocation, due to the tongue falling backwards, and spasm of the glottis induced by a collection of mucus in the throat. To prevent such an occurrence we keep the patient on her right side with her cheek on the pillow. If respiration ceases and cyanosis intervenes, the patient is turned on her abdomen with the head and shoulders hanging over the edge of the bed. It is sometimes necessary to perform artificial respiration and oxygen may be administered.

"Stimulation may be needed as atropine, digitalin, hypodermatic of ether. Food seems always to induce convulsive seizures, and thus no food should be given when convulsions have manifested themselves."

Conclusion. The decrease in the general matermortality rate must be made by the general practitioner.

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## AMYTAL THERAPY IN WHOOPING COUGH

Samuel G. Henricke, M.D.
PORTLAND, ORE.

Friedlander* states that the fact that a recent writer collected and listed four hundred drugs and therapeutic measures which were supposed to be beneficial in whooping cough is one of the curiosities of medical literature. Knowing how unsatisfactory are the results obtained with the use of the more recently suggested remedies, such as the rectal administration of ether in olive oil, roentgen-ray therapy, chlorine gas, ether hypodermatically and ephedrine hydrochlorate orally, it is with a degree of trepidation that I make so bold as to suggest No. 401, namely amytal, or as it is chemically known, isoamylethylbarbituric acid.

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* Abt's Pediatrics, Vol. vi, p. 142.

During the present epidemic I have used amytal compound, which is a combination of amytal 1½ grains and amidopyrine (diethylaminoantipyrine) 3½ grains. Naturally this combination is in no way specific but simply an efficient hypnotic, embodying amytal which attracted my attention because of its rapidly growing use in the realms of surgery and obstetrics. Judging from the enthusiastic reports as to its efficiency as a hypnotic, I felt it might be useful in solving the problem of how best to manage the severe nightly paroxysms of coughing so distressing to both the child suffering from whooping cough and disturbing to his attendants.

I felt that, if I could produce a deep enough sleep, the child would not become conscious of those prodromal sensations which precipitate a paroxysm of coughing. We have all used sedatives and antispasmodics with varying degrees of success, for the most part little or none. With the use of the combination of amytal and amidopyrine I have been able to secure undisturbed sleep in proportion to the success of the attendant in determining the proper dosage and assuring its administration.

The first patient for whom I prescribed amytal compound was seen for the first time during the paroxysmal stage. The mother stated that she coughed "all day and all night," and some ten minutes spent with the patient, a child of six years of age, on several occasions indicated that the mother's statement was hardly an exaggeration. Within such a brief period of time she would have five or six severe paroxysms of coughing. As a first dosage I suggested one-half an amytal compound capsule at bedtime, to be gradually increased to a whole capsule if the results were not satisfactory, and to be repeated at midnight if necessary. I suggested opening the capsule and, after dividing the contents as directed, placing the prescribed amount in a cavity made in a teaspoonful of jelly, thereafter mixing the jelly and the powder thoroughly. Two-thirds of capsule at bedtime proved adequate to provide both mother and child a night of undisturbed sleep. Omission of the drugs resulted in the occurrence of from twenty to thirty severe paroxysms of coughing.

So striking was the contrast between the nights with the administration of the medication and those without that I determined to continue the therapy in all cases where the severity of the paroxysmal stage indicated its necessity. After uniform success in twenty-five cases, I felt that the addition of this combination of drugs to our armamentarium in whooping cough therapy was worthy of consideration. The margin of safety, so far as the possibility of the production of toxic manifestations in the use of either of the drugs under consideration, is sufficiently great that they may be classified as nontoxic in any reasonable dosage.

## DOSAGE

The initial doses of amytal compound which I have found satisfactory, for different ages are as follows:

| | |
|---|---|
| 1 year of age | 1/4 capsule |
| 2 years of age | 1/3 capsule |
| 3 year of age | 1/2 capsule |
| 5 years of age | 2/3 capsule |
| 7 years of age | 1 capsule |

These doses may be administered one-half hour before bedtime in jelly or some other suitable vehicle, as suggested above. A hot drink immediately after will facilitate absorption and may be given if a tendency to vomit does not contraindicate it.

When vomiting after the evening meal is an anticipated occurrence, it is advisable to administer the drugs about one-half hour before that meal. The suggested dose may be repeated at midnight, if indications warrant and should be gradually increased each night until satisfactory results are obtained.

I find the amytal compound capsule preferable for the reason that its contents are better adapted to accurate division in the home than is the amytal tablet. Furthermore, the amidopyrine present in the capsule, being an ethyl compound, has itself hypnotic properties and, as do all the common members of the analgesic antipyretic group of drugs, it has a tendency to favor the onset and maintenance of normal sleep as well as allaying nervous excitability. The results obtained in twenty-five severe cases of whooping cough justify its recommendation to the profession for further trial.

418 East 42nd Street North.

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Ephedrine Sulphate in Treatment of Acute Shock from Trauma or Hemorrhage. Carl A. Johnson, Chicago (*Journal A. M. A.*, May 3, 1930), attempts to show by animal experiments and by case reports that ephedrine sulphate used intravenously as part of the medication, is a useful drug in the treatment of acute traumatic shock and shock due to hemorrhage. He is inclined to believe that its prolonged action on the central nervous system is almost as important as its hemodynamic action in overcoming the vicious circle established by the low blood pressure or the depression of the central nervous system. An effective dose is nontoxic (Chen), and there is a prolonged action on the central nervous system which is not dependent on the blood pressure change, although the central action is probably enhanced by the increased blood flow through the depressed centers. In the cases cited the action of the ephedrine administered was sufficient to overcome the vicious circle established by the low blood pressures from hemorrhage or the depression of the central nervous system.

# ECONOMIC ASPECTS OF ILLNESS*

H. J. WHITACRE, M.D.
TACOMA, WASH.

There was a time when we talked about the art and the science of medicine. Times have changed. We now talk about the science, the practice and the economics of medicine, and only recently has the economic side of illness been given serious study.

Right now the economics of sickness have been brought into compelling prominence by the creation of a Julius Rosenwald fund for its study, by numerous articles in newspapers, lay magazines and medical journals, and by the bulletins that have been issued by the national "Cost of Medical Care Committee." Every member of the medical profession should be informed about the discussion that prevails.

## THE EXTENT OF ILLNESS

Sickness and impairment is a problem so large as to touch every individual life and is so important in our political life as to be a matter of real concern to everyone who has risen to the level of citizenship. Everybody sooner or later meets the problem of disease.

The average individual between the cradle and the grave spends one-fortieth of his time in bed because of incapacitating illness. The average worker loses seven days each year and the 45,000,000 workers of the United States lose 315,000,000 days of work. One-fortieth of the population is constantly ill to the extent of being bedridden, and reliable statistics show that for every person in bed there are at least two who are impaired to the extent of 10 to 50 per cent of their efficiency by such chronic diseases as tuberculosis, cancer, heart disease, vascular disease, chronic indigestion and a great host of others.

## THE COST OF ILLNESS

The nation's bill for sickness, if itemized and totalled, would read as follows:

| | |
|---|---|
| 150,000 physicians at $3000 per annum | $ 450,000,000 |
| 140,000 private duty nurses at $1500 per annum | 210,000,000 |
| 150,000 practical nurses at $1000 per annum | 150,000,000 |
| 10,000 attendants at $1000 per annum | 100,000,000 |
| 50,000 dentists at $3000 per annum | 150,000,000 |
| 7,000 hospitals with a total of 860,000 beds | 750,000,000 |
| Druggists for medicine | 700,000,000 |
| 25,000 healers, chiropractors, osteopaths, christian science, etc | 50,000,000 |
| Total | $2,560,000,000 |

This means $20.83 per capita or about $100 per family. The U. S. Bureau of Labor Statistics has shown that the average wage earner's family spends about $60.39 per annum. The U. S. Department of Agriculture finds an average of $61.60 for the farmer's family and a large insurance company estimates the cost at $80 per family for clerical personnel.

This list represents solely the money outlay for sickness, however, and is only one-fourth of the true industrial loss. We shall have to add:

| | |
|---|---|
| Loss from deceased's wage earning capacity | $ 2,000,000,000 |
| Loss from permanently interrupted wage earning capacity through postponable deaths | 6,000,000,000 |
| Grand total, including sickness cost and earning loss | $10,560,000,000 |

(The total income of the United States is $90,000,000,000.)

These staggering figures bring forcibly before us the magnitude of the economic problem of injury and disease.

If the per capita percentage of this sum were a fixed charge upon the budget of each family in the United States, it could be managed; but this is not the way that it works out because only 25 per cent of families have sickness in a given year and one-eighth of the population is destitute.

The Metropolitan Life Insurance Company has made a survey of sickness cost for 3,281 middle class families and 17,129 persons scattered over most of the states of the union. For a period of six months from January 1 to June 30, 1929, their report to the "Cost of Medical Care Committee" shows that 64 per cent of the total cost of sickness in this group was borne by one-fifth of the families studied.

By and large the misfortune of illness is not budgeted by the average family because nobody knows when it will come and nobody can know whether it will be a $50 or a $500 illness when it does come. It is the $300, the $500 or the $1,000 cost for a given illness that breaks the back of the average worker.

Sickness does cost money and it is admitted on all sides that the cost of good medical care in both health and disease has necessarily and unavoidably increased during recent years because of improved methods of diagnosis and treatment. The real question that is now before us is, "Can the public afford to pay this increased cost?"

## THE BUYING POWER OF THE PUBLIC

Let us consider for a moment the buying power of the public as represented by the family earnings of the 45,000,000 persons in this country who are occupied and earning, taken from the data of the National Bureau of Economic Research.

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* Read before Pierce County Medical Society, Tacoma, Wash., March 25, 1930.

| | |
|---|---|
| Incomes over $5,000 per annum | 2 per cent |
| Incomes $3,000 to $5,000 per annum | 5 per cent |
| Incomes $2,000 to $3,000 per annum | 14 per cent |
| Incomes $1,500 to $2,000 per annum | 35 per cent |
| Incomes $1,000 to $1,500 per annum | 30 per cent |
| Incomes less than $1,000 per annum | 14 per cent |

If these figures are correct, it becomes apparent at once that the major percentage of the people have not a very large buying power and it is easy to conclude that a great many have not sufficient to get all of the medical care that they really need in sickness. As a matter of fact, some philanthropists and economists have concluded that the increasing cost of illness has gone to a point where all groups included in this chart *cannot* and *do not* get proper medical care, and that only the charity patient and the rich get the full benefits of the resources of modern medical science.

I am quite certain that the medical profession can and should emphatically deny this assertion. There are some swivel chair economists and parlor philosophers who unqualifiedly blame doctors, hospitals, nurses, dentists and druggists collectively or as individual groups for the high cost of medical care.

Fortunately the agencies that are constructively concerned about the problem are entirely sane and scientific in their approach to the subject and are trying to study it through. No conclusions have been reached and the "Cost of Medical Care Committee" states very definitely that no conclusions will be formulated until the study is completed. Statistics are being collected, some valuable studies have been made, and every group involved is called upon to cooperate to the fullest extent.

The best thinkers of the medical profession, both within and outside the "Cost of Medical Care Committee," are giving attention to the subject and say that, even though the increasing cost of medical care cannot be laid at our door specifically, the medical profession should take a major part in the discussion, study cost, leaks and efficiency in our business methods, and contribute a discussion equilibrium which can be given only by those who are actually treating the sick. Let us grant that the buying power of the average family for medical care is small and turn our attention to the economic, educational, sociologic and psychologic influences that bear down upon this small family income and influence its buying power for any sort of commodity (chart 1).

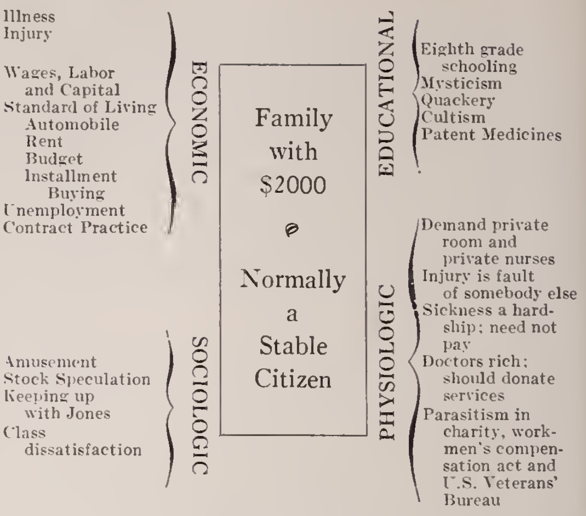

Chart I—The economic problems and influences that bear down upon the family of low income.

The cost of medical care is a mere dot on the economic map of this family. Let us not forget that the 98 per cent of people who are having a hard time in meeting the increasing costs for care in sickness are the same 98 per cent who are crowding our highways with automobiles, jamming places of amusement every night of the week, and buying the luxurious necessities of our present higher standard of living. The problem is huge and he who runs can see readily that no single formula will remedy the economic dilemma in which the low wage man finds himself.

### SOME PROFESSIONAL FACTORS

In the middle ages the care of the sick was largely a service of charity, rendered by priests, sisters of charity and religious hospitals, and it would seem that some of this concept has been handed down to modern society to create a rather fundamental economic error in public thinking, to the effect that service in illness should be rendered without charge. The present economic study is certain to bring out strongly the fact that service in illness is a commodity, that it has a definite production cost and that the producer of this service is entitled to a fair profit, except that hospitals do not as a rule expect a profit.

### HOSPITAL SERVICE

It is very easy for anybody to understand that hospitals and hotels have a tangible production cost. Everybody knows that basic living costs have gone up. Add to this the increased patronage of hospitals, as is evidenced by the fact of 150 hospitals in the United States a century ago and 7000 hospitals with 860,000 beds in 1928, and we find at once a huge factor in the increased cost of illness. This is not all, however. The extra or special service charges for operating room, anesthesia, laboratory service, roentgen rays and special nursing may in certain cases bring the patient's expenditures for hospital care up to an unexpectedly large total. It has been estimated that these special services amount to 30-60 per cent of the average private patient's hospital bill.

The average basic production cost in the U. S. is $5 per day. Many hospitals are operating upon a much lower cost, and there is an increasing tendency in hospital construction to provide small wards and semiprivate rooms for the patient of moderate means. Publication No. 4 of the "Cost of Medical Care Committee" reports a recent survey of 467 hospitals with 59,141 beds which shows 26,900 beds in single rooms, 15,437 in semiprivate rooms and 16,804 in small wards. Only 20 per cent of the beds in private rooms can be secured for less than $5 per day, while 72 per cent of those in semiprivate rooms and 93 per cent of those in small wards are priced at less than $5. About 32 per cent of small ward beds and 11 per cent of semiprivate room beds were under $3 per day.

The Massachusetts General Hospital has constructed a hospital of 300 beds for the patient of moderate means. The rates are:

| | |
|---|---|
| Bed in a 9 bed room | $ 4.00 |
| Bed in a 4 bed room | 4.50 |
| Bed in a 2 bed room | 5.50 |
| Bed in a single room | 6.50 |
| Operating room and delivery room, including laboratory fee | 15.00 |
| Roentgen-ray fee, minimum | 5.00 |
| Laboratory fee | 10.00 |
| Anesthetic fee | 5.00 |
| Special nurses, per day or night, including nurse's board | 7.50 |
| Maximum professional fee | 150.00 |

A folder published by this hospital states that "the object of this department is to provide the people of moderate means, who become ill or have illness in their families, with the best hospital and professional care at cost and within their financial reach."

The University of Chicago has likewise established a hospital for patients of moderate means and their charge is $5 per day for a bed in a sixteen bed pavillion with extra charges for professional services, roentgen rays, metabolic tests and electrocardiograms. No extra charge is made for general laboratory work.

Many hospitals are charging all patients who are in the hospital over three days a flat laboratory fee of $5. The Vassar Brothers' Hospital at Poughkeepsie, N. Y. charges a flat obstetric fee of $65 for semiprivate and $35 for ward patients. The Delaware Hospital, Wilmington, Delaware, charges a flat tonsil fee for twenty-four hours service of $10 for private, $8 for semiprivate patients and $5 for ward patients.

Hospital charges are admittedly high. They are high because of production costs and as yet no very practical suggestion has been made for reducing the cost of this type of service. For the present the most practical way for the average patient to keep down his hospital bill will be to choose accommodations within his means and get along without special nurses except in times of real need.

### PROFESSIONAL CHARGES

Professional charges constitute from 40 to 50 per cent of the total bill for sickness and this element in the cost must be studied. Unfortunately there are, as yet, no facts available regarding the cost of producing a doctor, a house visit or an operation. It must be admitted, however, that the doctor's service is a commodity, that there is a production cost and that somehow the doctor must be paid enough to enable him to pay his production cost and give him a decent living.

We do know in a general way that the investment cost in a professional education has increased enormously. Thirty years ago a doctor was graduated in two years at a small cost, whereas he must now spend six years of time and about $10,000. We also know that the present day high office rent, expensive equipment, costly office attendants and heavy transportation expense have greatly increased the cost of operation. Living costs have gone up for the doctor's family likewise. All along the line costs have advanced but the fees of the "run of the mine" doctor have not increased correspondingly. A majority of physicians and surgeons state very frankly that their charges are not higher than they were twenty years ago. They do admit, however, that the patient's total bill is very much higher because of the increased cost of diagnosis. It is not at all unusual for the diagnosis charges, resulting from a first visit to a physician, to mount up to $50, yet the physician gets only five or ten dollars out of this sum total. The remainder goes to the general laboratory, roentgen rays and consulting specialists.

Charity work should be charged against the cost of production. Time and service are money in the economic world and two hours of a physician's working day spent in treating the destitute must be paid for by somebody. The physician must either work longer hours or charge more for his services during the remaining hours of his day. One-eighth of the sick are destitute and it has been estimated that the physicians of the United States contribute $456,000,000 each year to charity work, as estimated upon a minimum charge basis of $2 per call. A survey in St. Paul showed that each physician was contributing roughly $3,000 per year and a recent survey in Tacoma indicated about $1,800 per year for each physician reporting.

The medical profession counts it a priceless privilege to be able to render service to the destitute without pay, yet a study of economics must raise the question as to whether it is its obligation to bear the entire load and whether it would not be better economics for the community to carry the load by taxation and pay the doctor a cost price for his services. What other business does free work as a part of its regular program?

Contract practice has seriously upset the economic equilibrium of medical service. Contract practice per se is not unethical and is at times an economic necessity. It is economically wrong, when it becomes an unjust medical monopoly or when the compensation is below the usual fees paid for the same kind of service and class of people in the same community, or when the compensation is so low as to make it impossible for competent service to be rendered. It is economically and professionally unsound, when the percentage of profit accruing to the holder of the contract is contingent upon a minimum of service.

Are the doctors charging too much? The fact that they do not get rich in the practice of medicine would seem to indicate that they are not enjoying an unusual margin of profit. The average net income of doctors throughout the United States is estimated as $3,000 for general practitioners and $5,000 for specialists. A survey of the 2,000 doctors in Kansas showed the average net earnings per doctor to be $1,575. A recent survey in Tacoma in which 75 out of a possible 145 doctors responded, showed that 60 per cent had a net income of $5,000 or less; that 10 per cent had an income of about $3,000; that four had a net income of about $2,000 and six an income under $1,000 per year.

Specialism, with its higher service charges, has been strongly attacked as one of the causes of the increasing cost of medical care. Publication No. 3 of the "Cost of Medical Care Committee" reports 15,417 specialists in the United States in 1925 and 19,277 in 1928. This is a considerable increase over a period of three years. Specialism is undoubtedly the tendency of the age and a part of general advance, yet we can profitably study the question as to whether or not the allurement of a better living has resulted in an uneconomic multiplication of specialties and specialists.

There is a tendency on the part of some hasty writers to lay great stress upon the occasional large surgical fee or the large total sickness cost of some prolonged illness and create the impression that this is the rule. On the contrary, doctors always have adjusted their charges to the income of the patient and up to the present time have borne the full brunt of the increasing cost of sickness as is represented by low fees, uncollected bills and charity. Unfortunately there are commercial doctors who are advising operations because of the fee involved and are charging excessively for their services. These men are a reproach to our profession and are largely responsible for the unfavorable criticism that has been directed against us.

Doctors as a whole probably do not charge too much. Indeed, there is a widespread opinion within the profession that they are underpaid. Nevertheless it must be admitted that the economics of the profession is sadly unorganized and that much can be done to improve the financial status of both doctors and patients. A pertinent illustration of the preceding statement is given by the recent Tacoma survey which showed that the business overhead of the seventy-five doctors reporting varied from 13 to 92 per cent. Cooperative laboratories, quantity buying, standardized equipment, cooperative offices and fewer roentgen-ray pictures are subjects that might well be studied.

It is strongly recommended that each county medical society create a permanent economic committee, made up of open minded, strong men who will study thoroughly and report frequently on their own findings and those of the "Cost of Medical Care Committee." Only in this way can we become broadly informed, organization-minded and effective in meeting an inevitable economic readjustment.

### NURSES

The nursing profession is seriously involved in the controversy because the trained nurse finds herself between the economic millstones of hospital and professional survival. Fifteen dollars per day for a day and a night special is a heavy additional load upon the resources of the patient of moderate means, yet this service is indispensable in the more serious cases. The nurse is not to be blamed, since each gets only $6.00 of the $7.50 charge, is employed on an average for only eight months and receives a net income of only $1,500 per year. She is underpaid. Undoubtedly there must be a reorganization of the methods of rendering nursing service so that more people can afford nursing care, and all nurses may be continuously occupied and better paid.

### REMEDIES

Thus far we have before us only the assertion that the low wage family has a low buying power for service in sickness, and that as a result of this inability to pay the working man is not getting all of the medical attention to which he is entitled. Before discussing the remedies that have been suggested as possible solutions of the problem, it would seem to me that for fairness two counter assertions should be made.

In the first place, it should be stated that the low wage man can afford to pay for medical care because he does, and secondly it should be asserted that the medical profession is not ready to accept the statement that the low wage workers as a class are now getting inadequate service. Barring the exceptional case, every sick man, woman or child who applies for treatment gets the very best care that doctors know how to give and the allied professions of medicine, nursing, dentistry and pharmacy are today giving the American people the best all around medical service that any nation has ever had in the history of the world.

All agencies involved in the care of the sick have wrestled for ages with the problem of treating the destitute and the low income family, and all expect to cooperate fully in seeking a solution of the intensified problem that has been created by modern economic stress. When the study has been completed, it may be determined that hospital costs can be reduced by lowered administrative expense, more low priced rooms, the use of low priced beds instead of private rooms by patients on low income, cooperative laboratory service, fewer roentgen-ray pictures, and earlier discharge to convalescent hospitals. Such reductions will not solve the problem, however.

Physicians can improve conditions for themselves and for patient by cooperative offices, cooperative laboratory service, standardized equipment, reduction in overhead, improved collections, elimination of unnecessary roentgen rays, elimination of the commercial doctor, elimination of uneconomic contract practice and lastly by an education of the public in the possibilities of modern medicine. Nursing service can be readjusted on a basis of an organized graduate nurse staff and hourly nursing, so that more people can afford expert nursing and nurses will receive better pay.

Pay clinic group practice has been advocated by some economists as the best agency for giving good all around service at a minimum cost and the Cornell Pay Clinic and the University of Chicago Pay Clinic, both for low wage people, are cited as interesting experiments. Dr. M. L. Harris of Chicago has insisted that the profession has an inescapable obligation to see to it that all of the public gets good medical care and has advocated a community pay clinic which should be organized by the county medical society and for the business of distributing a high class of medical care to all who are in need of it. The rates of charge should be determined by the economic status of the individual. Charity patients should be paid for by the county and those who are able to pay the regular rates of physicians should have their own as at present.

The Endicott-Johnson Corporation, employing 16,000 men, has organized a full medical service for employees and their families, pays the total cost and finds that it averages $52.60 per employee per year. It is stated that this adds two cents to the production cost of each pair of shoes manufactured. Health insurance is the remedy that has been suggested by a great many writers and it is probable that insurance companies will ultimately work out a policy that will be within the reach of the low wage worker and enable him to "lay by for a rainy day."

It will be observed that all of these suggested remedies are mere nibbles at the great problem and that none of them are real solutions. It is probable that no single remedy will solve the problem and that the status of the low salaried man as well as that of medicine will have to evolve with the untangling of existing economic uncertainties.

Organized medicine is ready to help intelligently, yet I am certain that the chief concern of the science of medicine must continue to be the quality of its service to humanity and not its cost. I believe that we can all agree with Dr. Edward O. Ochsner, when he says, "next to the stability of government, honesty of administration, and general intelligence of the people, the welfare of the nation depends more upon the quality of medical service which is rendered to the people than upon any other one thing."

# ASIATIC AND EUROPEAN PEDIATRICS

H. H. Skinner, M.D.
YAKIMA, WASH.

In giving my experiences concerning visits to different pediatricians during a recent trip through Asia and Europe, I wish first to impress the thought that I merely made a thread through these countries and the most that can be given will be mere impressions and not facts based on extended experiences.

The first pediatrician I interviewed was Dr. Kuryama, Professor of Pediatrics in the Imperial University at Tokyo and also pediatrician to the royal family. My taxi dropped me at a rather rough, barrack-like building in the crowded section of the city which the driver, after various consultations with different persons, indicated by signs to be the place I sought. Upon entering the building, I noticed my way was almost blocked by innumerable sandals, Japanese shoes, American shoes, and what-not foot gears, more or less arranged in twos, beyond which was a platform.

The attendant by signs invited me on the platform and indicated that my shoes should also be left with the rest and I complied. However, my socks were not properly built to have the big toe fit in the rope-like appendage on the straw sandal furnished me. Consequently, after my guide started with her rapid slip-slap down the corridor and I was following to the best of my ability, off went one of my sandals. I retrieved it quickly and soon caught up, and after rescuing my sandals a few times, found the best way to really accompany my guide was to use the same mincing style of walk.

In his private office I found Dr. Kuryama. He was dressed in English style with Prince Albert coat, white vest, dark trousers and gaiters. He is a little taller than the average Japanese, well built with easy carriage and unassuming manner. He invited me to take tea. During the conversation over our cups I was impressed with his charming simplicity, direct forward manner, and was made to feel that he knows his subject well and is fully capable of fulfilling his enviable position. During our conversation that afternoon, for he gave two or three hours to me, he informed me that rickets is not seen very much in Japan, except in the northern part of the large island. Muscular dystrophy is fairly common and treated with histamin. Beri-beri is to be found among the children quite frequently and is treated very successfully by vitamin B. The Japanese have it in a concentrated form called oryzamin which can be given hypodermically in severe cases. A peculiar form of dysentery is also observed among the children, called ekery. Some men feel this to be due to the oga bacillus, discovered by a Japanese investigator.

He kindly, personally conducted me through the maternity and pediatric departments of the University hospital. In the maternity department the baby was in bed with the mother and in the pediatric the mother was in bed with the baby, which he explained was due to the custom of the people. In each department, in the aisle between the beds, a peculiar stove effect was seen by which the room was heated. This also served a double purpose, for on top there was ample space for the uncles, aunts, brothers, sisters and all other relatives to make all the tea everybody and all could need to manufacture for each ordinary and special occasion. From my observation I felt that no hospital inmate was lacking in plenty of tea drinking. The wards of the maternity and pediatric departments were hardly distinguishable except for the age of the children and that at the heads of the beds in the former were little baskets, in which the new born infant was occasionally placed. The chemical laboratory in connection with the institution was quite profuse in the number and amount of reagents but for the most part there was considerable confusion in arrangement.

A week or so later I visited Dr. Suzuki, Professor of Pediatrics in the Imperial University at Kyoto, where the hospital wards were a little better than in Tokyo but the laboratory outlook was about the same. A missionary hospital visited in Tokyo I found was quite up-to-date and modern in its ways and methods, the hospital regime also being patterned after American institutions. I also visited a maternity home in Kyoto which had a strange but really delightful intermingling of Japanese ideas and modern American hospital schooling, which institution was graduating unusually well trained midwives. It was really a gem and would do credit to any city in any country. I witnessed a delivery conducted by midwives instructing the students, and it was done in a skillful, painstaking and most commendable way.

As my trip took me hurriedly through Korea, Manchuria and Siberia, there was no opportunity to visit hospitals, but in Moscow after considerable red tape I finally gained admission to two. The first hospital was under the control of and conducted entirely by the Soviet government. It had been erected on the outskirts of the city, located in nice surroundings but not very ample. The building was of good construction, inside very neat, clean and well kept. I did not observe anything different from what one would see in any better than average hospital found in any city. The beds in the wards were not of the high type, which must be very hard on the nurses. They do not wear any particular distinctive dress, nor do the internes who wore the inevitable boots found everywhere. In the hospital I visited the operating room, a very large room which was equipped to accommodate two operations at the same time. The tables were not modern but were built of wood, the advantages of which were pointed out by our guide but which I felt really covered the fact that the expense of quite a modern table was obviated by using this one. On the other hand, over each table was a most up-to-date shadowless lamp. In this hospital, as in Japan and was seen later in Poland, the roentgen equipment was of German make and only fairly modern. My general impression of the hospital was excellent.

Two or three days later I was allowed access to a maternity hospital which, although located in the heart of the city and in a rather dingy building, was impressive as it was quite up to date in its methods. The interne, who spoke comparatively good English, informed me, in answer to my question, that abortions were done quite freely and always merely at the wish of the expectant mother. However, they were not performed unless the girl consented to go to the hospital. He added that the ease with which this practice could be used was beginning to affect the birth rate and he felt in a short time restrictions would be forthcoming.

With a little difficulty I interviewed the professor of obstetrics in the University of Moscow. It was not a particularly satisfactory visit, since my interpreter was a young married girl of nineteen years. She found it quite difficult to put my obstetric terminology into Russian, also to translate his Russian obstetrics into English. She stated to me afterwards that she learned more obstetrics in those fifteen or twenty minutes than she had ever expected to hear. I asked him what he considered the most important consideration in obstetrics today and he stated it to be the alleviation of pain in childbirth and the question of metabolism during pregnancy. He also stated that he was doing some research work in the latter.

During the fall of 1928, in my own practice, I observed from sixty to seventy cases of dysentery in babies which seemed of unusual type. Nine of them died. Autopsies were obtained in most instances and cultures were taken from the excretions, as well as from the different organs. After two months laboratory work Miss C. J. Prior of the Western Laboratories finally discovered the offending organism to be a pathologic colon bacillus.

The day after reaching Warsaw I called on Dr. Michalowiscz. I found him to be a most delightful, genial, enthusiastic and affable gentleman. My first question was regarding dysenteries in infants and, since he had been observing the same peculiarities in dysenteries that I had as mentioned above, and had also through extensive culture tests discovered the organism to be the same, the common incident made the ensuing visit unusually interesting.

He stated that one of his methods of treatment was to flush the lower bowel with one to one thousand silver nitrate solution. He felt that the upper bowel, when absorbing its content, directed such material through the liver. The lower bowel, on the other hand, absorbed directly into the blood stream and was therefore more toxic. He was writing a paper on the subject and expected to read it before a pediatric society in Scandinavia sometime in the summer or fall. He has under his direction a babies' hospital of eighty to ninety beds. My impression was that it was unusually well lighted with window space, nicely kept up and a credit to his skilled efforts.

I shall mention only one hospital among several which I visited in Brussels. Dr. Cordier had control of this babies' institution of eighty or ninety beds, supervised by a Catholic sisterhood. He is mostly interested in instances of pyloric stenosis of any form. He had a large number of charts covering a period of years which indicated his management of such cases. His only treatment was to give breast milk every two hours night and day. I asked him a number of questions. Do you ever give atropine? No. Do you ever use thick cereal? No. Do you ever use any sedative? No, I never use any drugs. Do you ever operate for the serious cases? No, I never use anything but breast milk. Do you ever lose any cases? Yes, I do, but do you not also? And I had to admit that he had me there. Some of his charts indicated that sometimes cases had been in the hospital two or three months before very much had been realized, and yet I had to admit that his results on the whole were worth consideration.

One question was, from what source he would be able to get sufficient breast milk. He had an arrangement with the maternity department of this hospital to the effect that when an illegitimate baby was born, the mother was given to understand she was allowed free treatment during the lying-in period and later she should come each day to the hospital and give what breast milk she could to the hospital over and above the supply for her infant. I visited a small room in which there were six such mothers expressing their milk into sterile bottles to be used for the orphans and prematures that required such food.

Again, I can only mention two hospitals observed in Edinburgh. The first one, visited with Dr. D. T. Finlay, was the one for contagious diseases. The size of the institution can be estimated, when one learns that during 1928 over eleven hundred cases of scarlet fever alone were admitted. The doctor in charge gave me one instructive point. He stated that when a child with diphtheria entered and diagnosis made, he mentally noted the amount of antitoxin that would probably be necessary, e.g., forty thousand would be given him today, perhaps twenty or even fifty the next and possibly another forty to sixty within a few hours. His method was to give his entire estimated dose at the first injection, that is, he would give one hundred thousand or more units the first time, which appeared to me as being rational. Dr. Finlay also directed me to a welfare station or hospital for maltreated children. Information about every inmate the authorities learn through anonymous letters written either to the police department or welfare station. He stated that, whenever an anonymous complaint was received, the proper authorities immediately investigated and, judging from their records, the results have been both astonishing and remarkable.

In Glasgow I spent most of my time in an unusually fine babies' hospital of some three hundred or more beds under the direction of Dr. Leonard Finlay, he being not at all related to the former Finlay. With so much supervising work as he had, I do not see how the man is able to make a living because all his efforts in this institution are wholly charitable. My first morning the results were six autopsies of small children, one or two of which were cases of tuberculous meningitis. He told me it was his experience that ninety per cent of the pulmonary cases in children were of the human type of bacillus, while of the enteric from fifty to sixty per cent were due to the bovine type. He also showed me interesting cases of tumor of the cord, congenital stricture of the esophagus, and a six months old baby, suffering with a severe attack of pertussis complicated by a bad prolapse of the rectum, the latter projecting three to four inches from the body. He placed it under anesthetic and injected absolute alcohol on either side of the bowel about an inch above the internal sphincter.

I had intended to visit Dr. Kerly of New York, from whom I have received very interesting and instructive points before, but my boat was a day late in docking. Consequently I found it necessary to go directly west.

## WIELDERS OF THE SCALPEL AND ADMINISTERS OF INSULIN AND CASTOR OIL

Carl J. Trauerman, E.M.
and
T. J. B. Shanley, M.D.
butte, mont.

For the moment imagine that you are in the hospitable city of Butte on July first, where will be held the eighth annual convention of the Pacific Northwest Medical Association which promises to be the largest in the history of the organization. The date set immediately follows the annual meeting of the Montana State Medical Association which will also be held in Butte. Lay aside your surgical gowns, caps, masks, rubber gloves, test tubes and stethoscopes and join the members of your profession from Utah, Washington, Oregon, Idaho, Montana, North and South Dakota, Minnesota and California, who already have made reservations to attend the gathering. Meet your old friends and make new ones.

Butte, the "richest hill on earth," will welcome you as you have never been welcomed before. The Honorable Mayor M. Kerr Beadle will present you with the key to the city and Chief of Police Jerry Murphy will throw away the keys of the jail. Butte and Montana will feel highly honored indeed to have you in their midst, especially in view of the galaxy of outstanding medical, surgical and research authorities who will appear on the three day program.

The above paragraph may sound extravagant, but you will not think so after perusing the schedule of scientific papers to be read and addresses given in the sessions which will run from 8:30 a.m. until noon, from 1:30 p.m. until 5:30 p.m.

### SOCIAL FEATURES

However, the meeting is not going to be entirely a clinical affair. The patient will quickly recover and on July first you will enjoy a smoker at the New Finlen Hotel, general headquarters of the assembly. At this smoker there will be novel forms of entertainment, such as Butte alone is qualified to give. Then there will be a huge banquet at the Silver Bow Club on July second, and golf at the Butte Country Club anytime you want to play. In addition there will be trips to the mines, including jaunts more than a mile underground; to the world's largest copper smelter at Anaconda; to Columbia Gardens and other points in the city, including Meaderville, one of the most "spirited" points in the old west, where you can get a counter irritant for your abdomen. And don't forget to bring your wives, as their entertainment will be fully provided for.

New Hotel Finlen, Headquarters for the Meeting.

At the banquet on July second, Dr. E. M. Gans will preside and Dr. Thomas M. Rivers, of the Rockefeller Institute of Research, New York City, will be the scientific speaker, his subject being "Spirit of Research." But, as Butte's own Al Jolson says, "you ain't heard nothin' yet," for at that same banquet you will hear the Hon. J. Bruce Kremer, famed orator, lawyer, statesman, National Democratic Committeeman from Montana for twenty-two years and prominently mentioned as a nominee for vice-president in 1928. The Honorable Bruce, contrary to his Scotch name, will not be tight with his words. He will speak on "Medicine from a Lawyer's Viewpoint," and his address will be neither scientific nor legal. But wait until you hear it.

While in Butte you will be as safe as though you were in the hands of your family physician or your spiritual adviser, the following being designated to take care of your every need: Dr. T. J. B. Shanley, chairman, and Drs. R. C. Monahan and H. A. Tash, members of the general committee on arrangements; Drs. J. R. E. Sievers and Alfred Karstad, president and secretary of the Silver Bow County Medical Asssociation, Drs. E. M. Gans of Harlowton and E. G. Balsam of Billings, respectively president and secretary of Montana State Medical Association. Beside the aforementioned, the subsidiary committees, consisting of fifty Butte doctors, will act as consultants to cure all ailments.

A Mine Shaft in Butte.

### BUTTE

Butte's mines have given to the world close to $3,000,000,000 in mineral wealth, being the world's largest copper camp with normal production of 300,000,000 pounds of the red metal per annum. It also produces several hundred million pounds of zinc per year and has produced up to 12,000,000 ounces of silver during a twelve month period. These mines have 2,700 miles of underground tunnels. Its new infant manganese industry supplies the largest tonnage of high grade furnace manganese in the world. And talking of infants, the air in Butte is so pure that it is not necessary to resuscitate the newborn with oxygen. They just open the window and the natural ozone does the work.

Visitors Will Be Taken a Mile Underground While in Butte.

Underground Mining View.

The formation of Butte's ore bodies and the working of them are both analogous and opposite to the work of the surgeon. Incisions are made in the earth by nature and fractures are filled with ore, rather than encased in plaster of paris. When an ore vein is cut underground, the mines do not bleed to death. The ore is injected into the bowels of the earth by pressure and not by the Murphy drip method. Working in the bowels of the earth, Butte's miners encounter many obstructions placed by nature. If any such are encountered during the forthcoming medical meeting, the mining companies will call on Dr. William B. Holden of Portland, president of your association, who is an eminent authority on bowel obstructions.

But getting back to production, Butte's greatest has been in the men who have been and are an integral part of its growth, such as Marcus Daly, William A. Clark, John D. Ryan, C. F. Kelley, F. Augustus Heinze, Frederick Laist and Miles Finlen, who attained leadership in mining, metallurgy and finance; Mary McLean and Berton Braley, literary lights; Julian Eltinge and Al Jolson of the footlights; Stanley Ketchell of the prize ring and "Fat" Jack of the highlights. In your own profession Butte is more than proud to be known as the cradle of Dr. John Hand, now one of the most prominent young surgeons at the Mayo Clinic, and Dr. James I. Farrell, at present prominent research worker with Dr. Crile of the Crile Clinic, Cleveland.

The city has excellent schools, including Montana State School of Mines, which ranks high among American technical schools, and the church attendance in the mining metropolis indicates excellent institutions of divine worship. Its cosmopolitan air is yearly accentuated at the banquet of the Friendly Sons of St. Patrick, where the sons of Erin are almost outnumbered by other nationalities and creeds, and where ham and fish are cooked in the same pot. Although Butte was first to have an "Al Smith for President" club, its politics does not flavor its community life, as the highway to the north is named for Al Smith and to the southeast it has the Roosevelt and Harding Drives, all of which wind round the mountains in graceful, well graded curves to cross the continental divide.

In Butte you will find first class theaters and shows, three golf links, laid out with eighteen holes (plus one), a beautiful Masonic Temple, Knights of Columbus, Elks and Eagles clubhouses, Y. M. C. A. and the Silver Bow Club. The latter is one of the most famous social clubs in the United

We Will Take care that Coyotes Won't Get You While You're in Butte.

Fish in Every Stream and We Will Show You the Stream.

States and you will enjoy much of its hospitality while in the city. Among Butte's other institutions are three modern hospitals, which it is hoped you will visit in a professional sense only.

If you feel as though you would like to "go to the dogs," visit the Highland Kennel Club, where nightly greyhound races are held, and some people know how to pick them. After the convention is over, if your scientific judgment extends to horse racing, jump on the bus for Marcus Daly Park, where the leading bangtails of the country daily are running, and sometime the horse you pick may win.

Butte is cut by a series of gulches, some of which have to do with the geological formation of its ore bodies. However, the most famous is Dublin Gulch, which was the early residence section of the district and which produced Charles P. Nevin, erstwhile mayor, state leader of one of the major political parties, prominent business man and known as Montana's premier before, during and after dinner speaker, which you will realize after you hear him at the smoker on July first.

### MONTANA

After the convention you will want to visit other points in the state, so we will try to paint a word picture of what there is to see and do. To get to Butte you will come from all points of the compass and you will cross the third largest state in the Union, it being 550 miles from east to west, as the young crow flies, and about 300 miles from North to South, as the "Old Crow" is transported. Its climate is superb, its birth rate high and its death rate low. Its air is so rare and purifying that a few years ago, after a pole cat had robbed a hen roost near Hardin, the farmer could find no trace of it, although he took up the trail only a few minutes after the marauder left. Surgeons in this state do not need to wear gas masks, even when they open a belly and find a colon bacillus infection.

Montana's scenic beauties are second to none and when in the state you will realize why the late Charles M. Russell, one of the foremost painters of western scenery and cowboy life, chose to live in Montana. His paintings grace the world's leading art galleries, but the largest collection graces the "Mint" of the Hon. Sid. Willis of Great Falls. And while we are talking about cowboy life, there is still plenty of it in the Treasure state, just like the days of old, with the exception that some of the cowboys ride the front seats of Fords, but find the riding rougher than the old method and often have to "pull fabrikoid."

If you believe in hot applications, go to Yellowstone Park, where you will find geysers aplenty and wild animals that will keep you constantly in "hot water." On the other hand, if you recommend cold applications, go to the Butte air port and fly to Glacier Park, where you can get more thrills and chills than Commander Byrd ever enjoyed when he tried to form a monopoly of the world's ice supply.

Perhaps you may want to enjoy a quiet rest at one of the many natural hot springs resorts, such as Gregson, Alhambra, Camas, Boulder, Hunters, Pipestone, Bozeman or Broadwater. The medicinal waters at these centers are high in curative power, no matter what your trouble may be, and the bathing and boiling out qualities are said to be one hundred and fifty proof. To sportsmen the wooded mountains and clear streams offer a virtual paradise for hunting and fishing. The water is so pure and the streams so clear that prostatic troubles are unknown. The fish are so large that disciples of Izaak Walton do not need a blood transfusion from truthful men. Now you tell one!

There are many beautiful lakes in the mountains and lowlands, which offer splendid camping sites, boating, bathing and fishing and the dazzling moonshine through the trees cures more ailments than anything you ever prescribed for. One of the most wonderful of the mountain lakes is Seely which Colonel Lindbergh chose for his first vacation after his lone flight to Paris.

Over $10,000,000 is invested in dude ranches in Montana, these resorts offering to dudes, dudines and dudettes the old western life with modern conveniences. So, if you want long horse back trips or pack trips into the almost unexplored interior, be a dude for a week or two. After such an outing a return to city life will make you doubt whether you have been Rip Van Winkle or have had the sleeping sickness.

Many of you are of a romantic turn of mind and enthuse in historic lore. Visit the spots where Lewis and Clark crossed the state, or the points where gold first was discovered and last, but not least, the home of the Vigilantes at Virginia City. By the way, the Vigilantes were the first throat specialists in Montana and they never found it necessary to advise tonsillectomy.

After visiting the mines of Butte some of you will no doubt want to visit the copper and zinc refinery and wire mill of the Anaconda Copper Mining Company at Great Falls and while in that city do not miss the famous falls along the Missouri River, where are located the main hydroelectric plants of the Montana Power Company, which supply most of the power in the state. In the vicinity of Helena may be seen the plant of the American Smelting and Refining Company, one of the largest lead smelters in this country and while you are in that neighborhood take advantage of a motor and boat ride through the far famed "Gates of the Mountains."

Motor trips should include the Morrison Cave to the east of Butte and a journey over the Rock Creek road to Phillipsburg and thence over the rustic Skalkaho road to Hamilton, into the Bitter Root Valley, where are grown some of the finest apples in the world. The mention of apples probably brings to your mind the old saying, "an apple a day, keeps the doctor away." Therefore, shortly before July first, put at least fourteen apples in your office, lock your door tight and come to the convention at Butte. Montana will be glad to furnish the apples for your office and the Butte committee guarantees that you will have a better time than Adam ever had in the Garden of Eden.

Dues of $15.00 for attendance at this meeting are now payable to Dr. Frederick Epplen, 639 Stimson Building, Seattle, Wash. Arrangements have been made for the appointment of various committeemen in Montana who will accept dues for membership. Hotel reservations can be made through Dr. Harold Schwartz, 58 West Quartz Street, Butte, Mont., or through the secretary. For further information or details, address Dr. Epplen.

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Epicondylitis Humeri. Seventy-four cases of epicondylitis humeri, better known as tennis elbow, have been treated by K. G. Hansson, New York, and I. D. Horwich, Buffalo (*Journal A. M. A., May* 17, 1930). Their conception of the pathologic condition in epicondylitis humeri is that of a periosteal fracture with a myofascitis of the extensor muscles which originate from the external epicondyle. Instead of subjecting these patients to different kinds of mobilizing treatments, they have based their therapeutics on physiologic rest, obtained by immobilization of the external epicondyle and the muscles originating from this bony ridge. The forearm and wrist are placed in a position that should allow the maximum relaxation of the muscles involved. They found that the most practical splint is the cock-up splint for the wrist, such as is used for a drop wrist. In addition to physiologic rest they used the following physical therapy for the relief of the myofascitis: In acute cases, treatment was given every other day with a ten minute application of dry heat, thirty minutes of diathermy, 900 milliamperes, with one electrode applied over the upper half of the extensor muscles and the other electrode over the whole flexor surface of the forearm. This was followed by ten minutes of medium massage. The chronic cases were treated with a static wave current over the extensor muscles for twelve minutes with a 2-inch spark gap, followed by static sparks over the same area for three minutes. With these procedures their results were quite gratifying.

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Devoted to the Interests of the Medical Profession of the Pacific Northwest
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JUNE, 1930

# EDITORIAL

## PROGRAM OF THE BUTTE MEETING

Last month were published the names of the men who will deliver papers at the Butte meeting of the Pacific Northwest Medical Association. The standing and reputation of these members of the medical profession are a guarantee of the superior quality of papers which will be presented. Below will be found the hourly schedule for the three days of this meeting. This attractive program can scarcely be resisted by all up-to-date and progressive physicians of the Northwest. Those who have attended sessions of this organization in past years realize that this is the greatest medical meeting held annually in the Pacific Northwest. They compare favorably with gatherings of similar character held in any other section.

| | Tuesday, July 1, 1930 Ballroom, Finlen Hotel | Wednesday, July 2, 1930 Ballroom, Finlen Hotel | Thursday, July 3, 1930 Ballroom, Finlen Hotel |
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| DR. A. J. CARLSON, Professor of Physiology, University of Chicago Medical School. | 8:30-9:15 —"Involuntary Nervous System and Circulation." | 8:30-9:15—"Involuntary Nervous System and Digestion." | 8:30-9:15—"Involuntary Nervous System and Metabolism." |
| DR. CHAUNCEY D. LEAKE, Professor of Pharmacology, University of California Medical School. | 9:20-10:05 — "Recent Advances in Anaesthetics and Drugs Depressing the Central Nervous System." | 9:20-10:05 — "Recent Advances in the Pharmacology of the Autonomic Nervous System with Special Reference to Circulation." | 9:20-10:05 — "Recent Advances in Chemotherapy." |
| DR. T. M. RIVERS, Research Worker in The Rockefeller Institute for Medical Research. | 10:30-10:55—"Spontaneous Generation in Relation to the Nature of Viruses." | 10:10-10:55 — "The Problems Concerning Chickenpox, Measles and Poliomyelitis." | 10:10-10:55—"Viruses in Relation to Tumors. Infectious Myxomatosis in Rabbits. (Sanarelli)." |
| DR. ALLEN K. KRAUSE, President and Director of The Desert Sanatorium and Institute of Research. | 11:00-11:45—"Some Aspects of Chronic Pulmonary Infections." | 11:00-11:45—"Physiological Relations in Tuberculosis." | 11:00-11:45—"The Question of Activity in Tuberculosis." |
| DR. HILDING BERGLUND, Professor of Medicine, University of Minnesota Medical School. | 11:50-12:30—"The Anaemias and Their Therapeutic Possibilities." | 11:50-12:30 — "The Value of Gastric Analysis. Discussion of Epigastric Distress." | 11:50-12:30 —"Therapeutic Possibilities and Responsibilities in the Various Types of Bright's Disease." |
| | 12:30-1:30—Luncheon. | 12:30-1:30—Luncheon. | 12:30-2:00—Luncheon. |
| DR. GEORGE B. EUSTERMAN, Head of Gastro-Enterological Section, Mayo Clinic. | 1:30-2:15—"Unusual Lesions of the Stomach and Duodenum with Differential Diagnosis." | 1:30-2:15—"The Significance of Gastric Anacidity in General Medicine and Gastro-Enterology." | 2:00-2:45—"Results of a Follow-up of Cases of Chronic Duodenal Ulcer on Ambulant Medical Treatment." |
| DR. EDWIN I. BARTLETT, Associate Professor of Surgery, University of California Medical School. | 2:20-3:05 — "Surgical Pathology of Carcinoma of the Breast." | 2:20-3:05 — "The Technic of Breast Operations." | 2:50-3:35—"Operative Conditions of the Neck with the Technic of Neck Dissection." |
| DR. HAROLD BRUNN, Associate Professor of Surgery, University of California Medical School. | 3:10-3:55—"Atelectasis of the Lung." I. | 3:10-3:55 — "Atelectasis of the Lung." II. | 3:40-4:25—"Cancer of the Lung." |
| DR. EMILE HOLMAN, Professor of Surgery, Stanford University Medical School. | 4:00-4:45 — "Pulmonary Suppurations. Important Factors in Its Development and Its Repair. Clinical and Experimental Study." | 4:00-4:45 —"Surgical Treatment of Pulmonary Suppurations: Postoperative Pulmonary Abscess, Chronic Bronchial Fistula, and Pulmonary Tuberculosis." | 4:30-5:15—"The Treatment of Burns from Inception to Complete Epithelialization." |
| DR. ANDREW STEWART LOBINGIER, Surgeon, Los Angeles, California. | 4:50-5:30—"Necrotic Edema of the Gallbladder." | 4:50-5:30—"The Pathogenesis of Pancreatic Disease." | |
| | 5:30-8:00—Intermission for Dinner. | 5:30-7:00—Intermission. | |
| | 8:00—Informal Smoker. | 7:00—Banquet, Informal, Silver Bow Club.<br>Dr. E. M. Gans, Toastmaster.<br>Toasts:<br>Hon. J. Bruce Kremer: "Medicine from the Lawyer's Viewpoint."<br>Dr. T. M. Rivers: "The Scientific Spirit." | |

OPHTHALMOLOGICAL SECTION
Small Banquet Room, Finlen Hotel

| | Tuesday, July 1, 1930 | Wednesday, July 2, 1930 | |
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| DR. MEYER WIENER, Professor of Ophthalmology, Washington University Medical School. | 10:00 A.M. — "Some Practical Points in Surgery of the Eye." | 10:00 A.M.—"Care of Injuries of the Eye." | |
| DR. MEYER WIENER, Professor of Ophthalmology, Washington University Medical School. | 2:00 P.M.—"Intraocular Operations." | 2:00 P.M.—"Plastic and Cosmetic Surgery of the Eye." | |

## HOW ABOUT A MEDICAL HOLIDAY?

It is always desirable for those engaged in similar pursuits and having kindred aims in life to make each other's acquaintance and establish relations of friendship and intimacies. Among no class of men is this more desirable than those of the medical profession. Rivalries and ill feelings are dissipated in proportion to the intimacies and contacts among brother physicians. In the Northwest the states are so large and the distances between cities so great that all of us tend to become more or less provincial. The close relationships and frequent meetings with one another which characterize the more populous sections of the eastern states are wanting among the doctors in the far west. Accordingly it is a part of wisdom to take advantage of opportunities of meeting one's fellow practitioners in the neighboring states of our great Northwestern domain.

The immediate opportunity of accomplishing such a purpose is presented in the series of medical meetings scheduled for Idaho and Montana. Why not take the wife and start on a tour from Oregon or Washington the last of this month, leaving in time to attend the Idaho State meeting at Coeur d'Alene, June 27 and 28. Then leisurely drive on to Butte, where the Medical Association of Montana will hold its annual session on the 30th. It is reported this association will omit the program of papers this year and devote the day to the annual business of the organization. Therefore, if the far westerners reach the city on this day, they will be given an opportunity for meeting new friends and renewing old acquaintances. This will be worth while as an opportunity of cementing friendly associations among representatives from the various cities of this section. Then on July 1-3 will follow the program of the Pacific Northwest Medical Association which will be the ultimate objective of all in attendance. It seems that a program of this sort should appeal to a liberal constituency from the Pacific Coast states.

## ANNUAL MEETING AT COEUR D'ALENE

The complete program is herewith presented of the annual meeting of Idaho State Medical Association to be held at Coeur d'Alene, June 27-28. The sessions will be held at Bozanta Tavern at Hayden Lake. Special attention has been given to entertainment features, as noted on the program. The woman's auxiliary will care for the visiting ladies who are expected to be present in large numbers.

### Scientific Program

Friday, June 27, 1930
9 a.m. to 1 p.m.

"Experiences with Sodium Amytal as an Intravenous Anesthetic." Dr. J. W. Baker, Mason Clinic, Seattle.

"Some Health Problems Encountered in the Care of the Pupils of the Idaho State Industrial School." Dr. T. A. Ellison, St. Anthony.

"The Treatment of Cardiac Irregularities." Dr. Wm. J. Kerr, Professor of Medicine, University of California, San Francisco.

"Principles Underlying the Treatment of Osteomyelitis." Dr. R. B. Dillehunt, Dean, Oregon University School of Medicine, Portland.

"Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis." Dr. W. E. Stalling, U. S. Veterans' Hospital, Boise.

Brief pause for station announcements. You may lunch, golf, swim, boat ride or auto ride but don't fail to get back by 6 p.m. for the boat ride to the boy scout camp and lunch.

Saturday, June 28, 1930
9 a.m. to 1 p.m.

"Recent Additions to Our Knowledge of the Functions of the Liver." Dr. Wm. J. Kerr, San Francisco.

"Recent Advances in Infant Feeding." Dr. E. J. Barnett, Spokane.

"Postoperative Surgical Care." Dr. J. W. Baker, Seattle.

"Resume of 100 Maternity Cases in the Pocatello General Hospital." Dr. D. C. Ray, Pocatello.

"The Management of Malpositions in Obstetric Work." Dr. G. Heusinkveld, Professor of Obstetrics, University of Colorado School of Medicine, Denver.

"Obstetric Films." Films loaned by Dr. C. H. Davis, Milwaukee, Wis.

Brief pause for further station announcements. There may be some business to attend to, but if you can get out of it remember what a good time you had yesterday and meet the ladies at 6 p.m. for the banquet at Bozanta Tavern, Hayden Lake.

President's Address. Dr. H. D. Spencer, Idaho Falls.

Words of Encouragement; Just Talk. Dr. Wm. J. Kerr, San Francisco, and Dr. G. Heusinkveld, Denver.

And many good things we haven't mentioned.

### PROGRAM AND ANNOUNCEMENTS OF THE ANNUAL MEETING OF THE WOMAN'S AUXILIARY OF THE IDAHO STATE MEDICAL ASSOCIATION

Registration will be at the Dessert Hotel Friday morning, June 27, 1930.

Annual meeting wil be held at the Dessert 10 a.m. Friday with luncheon following at the Bozanta Tavern. From these meetings special announcements will be made regarding entertainment.

The organization urges all doctors' wives to attend and help make this, their third annual meeting, the best ever, and not to forget the swimming togs and golf equipment.

President, Mrs. Alexander Barclay, Coeur d' Alene; Vice-President, Mrs. D. L. Alexander, Twin Falls; Secretary-Treasurer, Mrs. O. C. Carson, Lewiston.

## UNIVERSITY OF WASHINGTON POSTGRADUATE LECTURES

The fourteenth annual postgraduate course of medical lectures and clinics, sponsored by the University of Washington, offers a very attractive course for July 14-18. Dr. Judd of the Mayo Clinic in surgery, Dr. Addis of Stanford University in medicine, Dr. Brenneman of Northwestern University in pediatrics are well known in their special lines and will present the latest information in a series of lectures under each of these headings. Dr. Meyer of the University of California will cover a group of especially interesting subjects, dealing with preventable diseases, serology, pathology and kindred topics. The published program indicates that each lecturer will appear at the same hour each day instead of interchanging hours as has been the custom in the past. The lectures will be delivered in the new Guggenheim Aeronautics Hall, whose auditorium is of sufficient size to accommodate all comers, so that the sale of tickets will be unlimited. Those privileged to attend these lectures will be assured of satisfaction and profit.

## THE HIGH COST OF ILLNESS

Every individual as well as every family has been affected more or less by the increased cost of sickness which has developed during recent years. It has become a fertile topic for writers in the daily press as well as the magazines. Different contributors have approached the subject from various angles, each stressing the particular view of the situation which has appealed to him as presenting the greatest responsibility for the situation. Whatever may be the bias of the individual writer, all seem united in attacking the medical profession as perhaps the chief factor in the high cost of sickness. The opinion seems to prevail that all doctors are oppressors and are thriving on the physical misfortunes of the public. This results largely from the fact that, in order for a doctor to practice medicine in the present day, he must live in a respectable home, drive an automobile and be presentably apparelled, whether his income be three thousand or thirty thousand dollars per annum. In this issue is presented a paper by Whitacre,* who has studied this problem from an economic viewpoint, accompanied by a discussion of the financial relations of physicians to the practice of medicine. He offers a study of this aspect of the situation, based on data obtained from physicians of Tacoma, which presents a fair cross section of medical practice in the average city of one hundred thousand population. The facts herein assembled are worthy of careful consideration, not only by members of the medical profession but the general public. These data might well be read in connection with further publications presented by lay writers in order that all possible angles of the problem may be considered.

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* Page 271.

## THE JOHN PHILLIPS MEMORIAL PRIZE

The American College of Physicians has announced the foundation of the John Phillips Memorial Prize in honor of Dr. John Phillips, an eminent member of the profession and a Regent of this college for many years who met death in the Cleveland Clinic disaster last year. He was always interested in stimulating medical research and, therefore, this memorial prize for $1,500 has been founded which is offered for the best contribution in internal medicine or affiliated sciences, in accordance with the following rules:

1. The contribution must be submitted in the form of a thesis or dissertation based upon published or unpublished original work.
2. It must be mailed to the Executive Secretary of the American College of Physicians on or before August 31, 1930.
3. The thesis or dissertation must be in the English language, in triplicate, in typewritten or printed form, and the work upon which it is based must have been done in whole or in part in the United States or Canada.
4. The recipient of the prize would be expected to read the essay at the next Annual Meeting of the College, after which he would be officially presented with the prize by the President.
5. The College reserves the right to make no award of the prize if a sufficiently meritorious piece of work has not been received.
6. The announcement of the prize winner will be made not later than two months before the annual meeting.

Address American College of Physicians, E. R. Loveland, Executive Secretary, 133-135 S. 36th St., Philadelphia, Pa.

## CANCER RESEARCH IN CALIFORNIA

Following the recent newspaper publicity of cancer investigation activity in California, wealthy men of that state have rendered possible the establishment of notable research work which may have effective results in study of the cancer problem.* The Coffey-Humber announcement of their experimental work with suprarenal cortex extract has resulted in its extensive use in clinics in San Francisco, Los Angeles and other California cities. It is stated that almost two thousand inoperable patients are now receiving injections of this extract. Prior to treatment they express their willingness, without cost to them, to have autopsies performed in case of death. It is claimed that the publicity of this form of administration has developed probably the largest cancer clinics in the entire world. For the further promotion of cancer studies, the sum of $2,000,000 has been set aside by W. K. Kellogg of Battle Creek, Mich., and Pomona, Calif., for the establishment of the Kellogg Foundation for cancer experiments at the White Memorial Hospital of the College of Medical Evangelists at Los Angeles. Another donation has been made by a group of Californian citizens who have underwritten a subscription of $500,000 to be used in further cancer research work. All this notable interest in the cancer problem seems to have been incited among the citizens of California following the wide-spread publicity accompanying the announcement of the Coffey-Humber experiments with cancer. The whole country will await with interest the outcome of the studies inspired and conducted by these generous contributors.

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* Editorial, California and Western Medicine, Vol. XXXII, No. 5, May, 1930.

## THE GOITER MEETING

The program for the annual meeting of The American Association for Study of Goiter appeared in last month's issue. It will be held in Seattle July 10-11. A special car on the Canadian Pacific for eastern visitors will arrive Wednesday, the 9th. After the Thursday session the Seattle Surgical Club will schedule a barbecue or visit to Carnation for inspection of the farm and cattle. Friday evening King County Medical Society will have a banquet at Olympic Hotel. After a brief morning session on the 12th guests will be driven to Tacoma for luncheon, followed by a trip to Mount Rainier. All physicians of the Northwest are invited to attend this meeting.

## DR. GEORGE B. McCULLOCH

When a physician terminates his earthly career after a long period of activity, during which he has been a conspicuous figure in professional and civic life, it is fitting that special attention should be given his memory. Such a citizen was Dr. George B. McCulloch, who died in Seattle last month. For more than forty years he led the life of an active and distinguished pediatrician in this city. Being the first physician of the state to adopt the specialty of pediatrics, he supervised the rearing of two generations of children. In Seattle the name McCulloch became synonymous with the guidance and care of childhood. Parents and children in all ranks of society and spheres of activities loved him on account of his careful attentions to the little ones and his genial nature under all conditions. He was a lovable man, a friend to every physician and dear to the hearts of all people who knew him. Although he began the practice of pediatrics when as such it was in its infancy, he did not permit himself to become antiquated, but by reading and study he kept abreast of the times in all of the late developments in his specialty. He was active in establishing and managing the Children's Orthopedic Hospital, which from small beginnings has become one of the best known institutions of Seattle, administering to patients over a very wide territory. When the artist, Howard Chandler Christy, painted a portrait of Dr. McCulloch a few years ago, a most real and living likeness, it was presented to the hospital as a fitting tribute for the faithful labors which it commemorates. He will long be remembered as the children's friend and physician who was recognized as such during the period of Seattle's greatest growth and development.

# MEDICAL NOTES

Vancouver Clinics. The Summer School Clinics of Vancouver, (B. C.) Medical Association will be held June 24-27. An extensive and varied program of medical and surgical topics will be presented by seven distinguished members of medical school faculties, five from Canada and two from United States.

### OREGON

Child Guardian Clinic Planned, Representatives from the Portland school board, the court of domestic relations and the University of Oregon Medical School, together with other citizens interested in problems of mental hygiene of children and juvenile delinquency, met early in May to perfect an organization to carry on this work in the state of Oregon. As the result the Portland Child Guardian Clinic has been established under articles of corporation with Dr. Richard B. Dillehunt, dean of the University of Oregon Medical School, as president of the governing board. The clinic will be housed in the new out patient building now under construction at the medical school. Ultimately a modern psychiatric hospital is planned to deal with the prevention and early recognition of mental abnormalities.

Hospital Superintendent Honored. Portland physicians and nurses joined forces May 1 in tendering a banquet in honor of Miss Emily Loveridge, who had just completed forty years of service with the Good Samaritan hospital. For the past twenty-four years she has acted as superintendent of the institution. Dr. J. Earl Else acted as toastmaster. Addresses were made by Drs. S. E. Josephi, A. J. Giesy, C. H. Manlove and Theodore Adams.

Military Medicine Delegate Proposed. Representative Korell of Oregon recently recommended to President Hoover the appointment of Dr. Ralph Fenton of Portland as delegate to the International Congress of Military Medicine to be held at Budapest, Hungary, in 1931.

Medical Building Planned. Plans were recently announced for a $700,000, fourteen story medical building to be erected at the northeast corner of State and Commercial Streets in Salem.

Dr. Charles E. Westerhout, formerly of Westfir, has joined the Eugene Hospital and Clinic at Eugene. He will specialize in obstetrics and pediatrics.

Dr. F. E. Ralston of La Grande recently returned from New York, where he was enrolled in a postgraduate course. He also attended the annual meeting of the National Eye, Nose and Throat Society, which was held at Atlantic City, N. J., in May.

Dr. L. L. Truax of Klamath Falls, accompanied by Mrs. Truax, sailed last month for Europe.

Dr. O. G. McConnell of Independence is convalescing from an operation performed in Portland late in April.

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## WASHINGTON

Washington Tuberculosis Association will held its annual meeting at Winthrop Hotel, Tacoma, June 12-14. A symposium of "Hospitalization of the American Indian" will be led by Dr. J. N. Alley of the U. S. Tacoma Hospital, recently opened to care for tuberculous Indian children. Prof. John Weinzirl of the University of Washington will discuss some phases of "Research in Tuberculosis." There will be presented papers and discussions dealing with various aspects of the tuberculous problem. Everyone interested in the study and treatment of tuberculosis is invited to attend this meeting.

Sanatorium to be Enlarged. The board of commissioners of Snohomish county are at present considering plans for enlarging Aldercrest Sanatorium, in order to accommodate patients not only from Snohomish, but also from Whatcom and Skagit counties. Under this plan the last named counties, which do not possess sanatorium facilities, will reimburse Snohomish county for patients sent to Aldercrest. The enlarged institution will provide space for approximately seventy-five patients.

Marine Ward Needed. The need for a Marine relief ward for the Port of Longview was recently pointed out to the members of the Cowlitz County Medical Society by Dr. L. D. Fricks, director of the United States Public Health Service in the sixth district. He stated that he had recommended to the Surgeon General the early establishment of a ward for this purpose at Longview hospital with a part time medical officer and nurse in charge.

Medical Club Formed. Physicians practicing on the east side of Lake Washington were guests recently at a banquet at the new Kirkland hospital in Kirkland. Dr. George H. Davis acted as host. An organization of local physicians was formed, to be known as the Eastside Medical Association. Dr. Lytel of Bothell was elected president, Dr. George H. Davis of Kirkland, vice-president, and Dr. K. K. Sherwood of Redmond, secretary-treasurer. Monthly meetings are planned.

New Medical Offices Planned. An addition costing $12,000 is being erected adjacent to the State Bank of Sequim. Space on the second floor is to be provided for complete new offices for Dr. H. S. Jessup.

Nurses' Home Planned. Construction is expected to begin this month on a new $125,000 nurses' home at Providence hospital in Everett.

Healer Arrested Again. "Uncle Tom" Ferguson, aged "healer" of Auburn, was arrested late in April at Tacoma for practicing medicine without a license. Two years ago he was convicted on a similar offence in Judge Gordon's court in Seattle.

Dr. Frank Douglas, formerly associated with the Yocum-Curran Clinic in Tacoma, has returned to the Northwest after a year at the Los Angeles Children's Hospital, and will engage in practice of pediatrics in Seattle.

Dr. Arthur Betts of Spokane has renewed his association with Dr. C. B. Ward after a year's absence, due to ill health.

Dr. J. Reid Morrison was elected president of the Whatcom County Tuberculosis League at its annual meeting held in Bellingham.

Dr. F. J. A. Ditter of Toppenish has purchased the Wimberly hospital at that place.

Dr. J. W. Stevenson of Moscow, for the past ten years health officer of Latah County, has disposed of his practice in Moscow and has moved to Hoquiam, Wash.

Dr. A. C. Osterholm, medical missionary in the Belgian Congo, was a visitor in Olympia early last month.

Cowlitz County Medical Society met at the Hotel Monticello in Longview May 13. Dr. L. D. Fricks, director of the U. S. Public Health Service of the sixth district, and Dr. A. E. Suht, state health officer, were guests of the society and spoke on the desirability of forming a full time county health unit for Cowlitz county.

Whatcom County Medical Society met at Bellingham May 5. The principal address of the evening was given by Dr. F. J. Van Kirk, who has recently returned from an extended tour of Europe, Turkey and Egypt. He related his personal observations on medical and social conditions in these countries.

Spokane City and County Medical Society met in Spokane May 8. An address on "Personal Observations in Epidemic Cerebrospinal Meningitis" was delivered by Dr. Alfred E. Lange of Walla Walla.

Weddings Dr. Norman W. Murphy and Miss Andrina Rae, both of Seattle, were married in Tacoma April 13. Dr. Edward P. Condon and Miss Genevieve Peyton, both of Spokane, were married at St. Aloysius church in that city April 22.

## OBITUARIES

**Dr. George Beale McCulloch**, after a prolonged illness, died at Firland Sanitarium, Seattle, Wash., May 15, aged 71 years. He was born at Honey Grove, Pa., in 1859. He graduated from the State Normal School of Pennsylvania in 1881. His medical education was obtained at Bellevue Hospital Medical College, New York, where he graduated in 1885. He practiced at Ariel and Erwin, Pa., until 1888, when he located in Seattle. He was in general practice till 1901, when he began the specialty of pediatrics which he continued till his death. He was the first physician in this part of the country to adopt this speciality. Accordingly he was intimately associated with all the older families of the city. His services were given without reserve wherever sick children needed them. Hence affection toward him prevailed among all classes of people. His death leaves a notable vacancy in the life of his city.

**Dr. Charles S. Teel**, a pioneer physician of Bellingham, Wash., died at his home May 6, aged 69 years. He was born in Canada in 1861, but moved to Minnesota at an early age. In 1901 he graduated from the Kentucky School of Medicine, Louisville, Ky. After practicing for a short time in Tacoma and Fairhaven, he moved to Bellingham, where he remained in active practice until forced by ill health to retire. He is survived by a son Dr. Charles Teel, Jr., of Bellingham.

**Dr. Woods Hutchinson**, noted author and physician, who died in Brookline, Mass., April 26, was well known in Oregon medical circles in his early professional years. From 1896 to 1905 he was state health officer of Oregon. He was born in Yorkshire, England, in 1862, and graduated from the University of Michigan Medical School in 1884.

**Dr. Hiram M. Johnson**, Toppenish, Wash., died at St. Elizabeth's hospital in Yakima April 28, following a brief illness, aged 57 years. He was born in Indiana in 1873, and graduated from the Medical College of Indiana, Indianapolis, in 1903. He had practiced in Toppenish for the past twenty-five years and was mayor of that city several years ago.

**Dr. Benjamin Walter Provost**, Wenatchee, Wash., died at his home April 25, following a short illness, aged 42 years. He was born at Peru, N. Y., in 1888, and graduated from Loyola University School of Medicine, Chicago, Ill., in 1916. He spent two years in study in Paris and was also in active service in the medical corps of the army during the World War. After practicing for several years at Milwaukee, Wis., he moved to Wenatchee in 1928.

**Dr. G. Burwell Wilson**, pioneer physician of Pullman, Wash., died suddenly at his home in San Francisco, Calif., April 9, aged 69 years. He was born in 1861, and graduated from Cooper Medical College, San Francisco, Calif., in 1892. After practicing a short time in Johnson, Wash., he moved in 1893 to Pullman, where he remained in active practice until 1905. He then returned to California, and engaged in social practice in San Francisco.

**Dr. Robert O. Loggan**, Philomath, Ore., died at his home April 22, aged 76 years. He was born in 1854, and graduated from the University of Oregon Medical School, Portland, in 1886. He had practiced in Philomath for the past forty years.

## PORTLAND CHILD GUIDANCE CLINIC

At a meeting of the Portland Child Guidance Clinic Association in May, 1930, articles of incorporation of the association were completed and the Governing Board was elected, charged with establishment and maintenance of a Child Guidance Clinic. The association was formed several months ago by a group of citizens, among whom are Dr. Norman F. Coleman, Mrs. G. M. Glines, Mr. Horace Mecklem, Mr. A. M. Eppstein, Miss Emma DuBruille, Miss Elnora Thomson, and Mr. John O'Hara. The Governing Board consists of seven members, representing the Portland School Board, the Court of Domestic Relations, the University of Oregon Medical School and the public. Officers of the Governing Board were elected as follows: Dr. R. B. Dillehunt, President; Dr. Laurence Selling, Vice-President; Mrs. Lloyd Frank, Treasurer; Judge Clarence H. Gilbert, Alfred A. Aya, and John A. Laing, members. Miss Theodora Schwankovsky was elected Secretary.

The association is formed for the purpose of establishing facilities in Portland for the study and relief of conditions arising from mental abnormalities in children. Numerous problems of juvenile delinquency, retardation in school, abnormal behavior, waywardness and inadaptability are associated with and the result of psychologic and psychic or mental disorders, and modern psychiatry or mental treatment is capable of affording relief in many instances through medical, psychic and social ministration. As the first measure in this direction the Governing Board proposes to establish a Child Guidance Clinic. Similar clinics have long been conducted in many cities and particularly in centers of medical education, with great benefit to the community.

The clinic comprises a personnel, consisting of a psychiatrist, a psychologist, social service workers and clinical aid. Inasmuch as the chief fields in which mental abnormalities become apparent and require study are the public schools and the juvenile court, the clinic will be conducted in close cooperation with the two, affording authoritative study and counsel to the schools and the court in the attempt at providing special facilities for those who are backward in school and assuring justice and suitable treatment for those under supervision of the court. The relationship between physical and mental defect requires careful physical as well as mental study, so that cooperation is established with the medical school to afford general physical examination and treatment to those whose physical disease may contribute to mental delinquency.

It is proposed by the Governing Board to establish the clinic as soon as practicable in the new clinic building of the University of Oregon Medical School, where special rooms are provided in the new structure, assuring proximity and accessibility of other clinics in general diseases of children, the eye, ear, nose and throat, and laboratory service in all departments. The services of the clinic will include, in addition to general physical examination and prescription when needed, intimate studies of the mental basis for behavior problems with a view to segregation of those capable of cure, those capable of improvement or requiring supervision of a certain form and those incapable of any remedy and requiring permanent custody. Through such service it should be possible to restore to usefulness a certain number laboring under remediable maladjustments, relieve others and anticipate in others serious affections which lead to juvenile criminality and thus prevent it. Such service implies not only examination and treatment of the child but counsel in adjustment of social and environmental conditions in the home through instruction and advice to parents and guardians.

The facilities of the clinic also afford opportunity for the development of the department of psychiatry in the medical school and will enable more advanced teaching in this important subject to the future doctors of the community, social workers, nurses and others. A logical outgrowth of the clinic should be the establishment of a modern psychiatric hospital at Portland, in which not only children but adults may secure early and effective diagnosis and medication of mental abnormalities which do not justify commitment to an asylum and which under suitable conditions may be cured.

The expenses of the clinic will be met partly from appropriations from the School Board, the Court of Domestic Relations, the medical school and other organizations, and partly from subscriptions to membership in the association, endowments, private gifts and benefactions.

# REPORTS OF SOCIETY MEETINGS

## OREGON

### SOUTHERN OREGON MEDICAL SOCIETY

Pres., J. C. Moser; Secty., E. A. Woods

Southern Oregon Medical Society held its annual meeting in Medford May 14. Among those who delivered scientific papers were Drs. Otis Akin, Frederick Stricker, Albert Mathieu, R. B. Dillehunt and R. C. Coffey, of Portland; Dr. Sterling Bunnell of San Francisco, Calif.; Drs. G. E. Houch and A. C. Seeley of Roseburg; Drs. J. C. Moser and J. D. Hand of Grants Pass and Dr. Homer Wheelon of Seattle, Wash.

Officers for the ensuing year were elected as follows: President, Dr. D. M. Brower, Ashland; vice-president, Dr. S. C. Adams, Klamath Falls; secretary-treasurer, Dr. E. A. Woods, Ashland. Dr. R. W. Clancy of Medford was elected to the board of governors, while Dr. J. C. Hayes was chosen to represent the society at the state medical convention.

## WASHINGTON

### KING COUNTY MEDICAL SOCIETY

Pres., D. H. Houston; Secty., A. J. Bowles

A general meeting of King County Medical Society was held in the auditorium of the Medical-Dental Building, Seattle, May 5, with President D. H. Houston in the chair. About 175 members were present. Minutes of April 7 were read and approved.

Dr. Alfred Balle reported a case of syphilis of the liver which was discussed by Dr. von Phul.

Dr. F. S. Bourns discussed "Some of the Ordinary Uses of Radium." On account of the similarity of roentgen rays and radium, either or both can be used on living tissues. The simplest action of the rays is on capillary blood vessels, as in angioma or nevus. Hemorrhagic effusions of the pleural or abdominal cavities are checked through its action, likewise hemorrhage from carcinoma. Uterine fibroids and toxic goiter yield to irradiation with no mortality rate. Skin neoplasms of all kinds can be successsfully treated with radium. In discussion Dr. J. T. Dawson emphasized especially the successful application of radium in the treatment of cervical cancer. Results of surgery for cancer of the bladder have not been satisfactory, but combined with radium beneficial results are obtained. Dr. L. L. Stephens stated that surgery of cancer of the breast in the Memorial Hospital of New York showed 25 per cent cures, which was increased to 45 per cent with radium.

Dr. H. E. Allen demonstrated the application of the Gibney dressing for sprained ankle. This permits flexion and extension without lateral motion. Walking is encouraged, which helps to massage the edema about the joint.

Applications for membership were received from W. R. Firey, R. E. Seth and Elizabeth Gunn. C. A. Fitzgerald and N. W. Murphy were elected to membership.

Dr. Houston announced that the committee appointed to investigate contract practice had failed to function and was discharged. Dr. H. J. Davidson gave a report relative to progress in this investigation. Dr. George C. Miller proposed that a commimttee of three be elected from nominations from the floor. This motion having failed to carry, Dr. Davidson was appointed chairman of a new committee, the other members of which were to be selected by him.

### KLICKITAT-SKAMANIA COUNTIES MEDICAL SOCIETY

Pres., Allen Bonebrake; Secty., J. R. Barber

The annual meeting of Klickitat-Skamania Counties Medical Society was held at Goldendale May 15. The afternoon session was held under the auspices of the Woman's Club, to which the public was invited. After the usual business of the club, the meeting was turned over to the medical society.

Dr. Frank R. Menne, of University of Oregon Medical Department, delivered an address on "Cancer, Its Nature and Origin." The general nature of cell-division was explained, and the errors of development which produce defectives, monstrosities and tumors were indicated. The extremely complex nature of the cancer problem was discussed. The public should be made to understand the greatly varied nature of malignant growths and the consequent difficulty met by research students who address themselves to the labor of solving its problems. Dr. R. L. Benson followed with suitable remarks, and there was a general discussion, led by various questioners from the audience. The ladies of the club entertained their guests at tea after the meeting.

The regular spring dinner of the society was given at the home of Mrs. E. C. Trost, former president of the Woman's Club. Among the guests were the two speakers of the afternoon and evening, and representatives of the medical profession from The Dalles, Hood River and Carson. Dr. R. L. Benson, of Portland, read a paper on "Asthma, a Hopeful Disease." Most attention was given to that form of asthma due to sensitization from bacteria. He makes it a routine to take cultures from the nose, throat, sputum and stools. In many cases pure cultures may be obtained of organisms, to which the patient can be shown to be highly sensitized. By the administration of suitable desensitizing doses, which must be much smaller than the usual immunizing doses given for other purposes, it is often possible to give immediate relief, and even to accomplish a cure, if it be proper to use such an optimistic term. The paper was discussed by members and their guests. Dr. Menne made interesting observations on the cancer problem of a more technical nature, dealing with some recent activities directed toward the cure of this disease.

A short business meeting of the society followed. The retiring officers were reelected for the following year as follows: President, Dr. Allen Bonebrake of Goldendale; Vice-President, Dr. S. H. Hodgson of Stevenson; Secretary-Treasurer, Dr. John R. Barber of White Salmon; censors all to hold office for one more year.

### PIERCE COUNTY MEDICAL SOCIETY

Pres., C. F. Engels; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held at the Tacoma Hotel, Tacoma, May 13. An informal diner was tendered Dr. G. Shearman Peterkin of Seattle by several members of the society preceding the meeting.

The following members of the staff at United States Veterans' Hospital No. 94, American Lake, were accepted as members of the Pierce County Medical Society in accordance with our by-laws: Drs. Harry Rubin, Frederick P. Sims, G. O. Ireland, C. E. Whitney and Jesse M. Worthen. Dr. George J. Vandenberg was unanimously elected a member of the society.

The secretary read a letter from the Washington State Medical Association regarding an anonymous letter being sent to members of the medical profession in the state, purporting to come from a group of physicians who are organizing for the purpose of doing away with the Public Health League. Motion was made and carried that a letter be given to the Public Health League, expressing the commendation and confidence of the Pierce County Medical Society.

The following officers were elected for the ensuing year:

President, Dr. D. M. Dayton.

Vice-President, Dr. E. C. Yoder.

Secretary-Treasurer, Dr. W. B. Penney.

Trustees, Dr. H. G. Willard, Dr. S. M. MacLean and Dr. H. S. Argue.

Holdovers, Dr. E. F. Dodds and Dr. D. M. Dayton.

Delegates to State Meeting, Dr. H. G. Willard and Dr. W. B. Penney.

Holdover, Dr. W. D. Read.

The first paper of the evening was given by Dr. Christen Quevli, Jr., on "The Value of Fluoroscopy in Diseases of the Heart and Blood Vessels." It covered the fundamental principles of the interpretation of fluoroscopic findings, and was profusely illustrated by lantern slides. Discussed by Drs. J. F. Steele and E. D. McCarty.

The second paper was "A Study in Contraceptives as Viewed from a Study of European Conditions," by Dr. G. Shearman Peterkin of Seattle. This was a sane, scientific study of the whole subject of contraception, and was presented in a very pleasing manner. Discussion by Drs. C. W. Whitaker, C. F. Engels and T. B. Murphy.

### WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., J. T. Rooks; Secty., C. J. Johanneson

Walla Walla Valley Medical Society held its regular monthly meeting May 8 at the Marcus Whitman Hotel, Walla Walla. Over forty doctors were present, including Drs. Lewis, McCune, Conklin, Skinner and Connue of Yakima, W. B. Penny of Tacoma and J. P. Brennan of Pendleton, Ore.

Dr. W. B. Penny delivered an address on "Diabetes." He stressed the importance of considering the patient's habits, likes and dislikes for foods in prescribing a diet. This must contain a satisfactory amount of sugar producing foods. The patient must be educated as to proper balance and intake of food.

Dr. P. J. Lewis discussed "Diabetic Coma." This usually results from failure to follow prescribed diets, overeating or omission of insulin. This is an emergency condition and its result depends largely on complications such as gangrene, infections, etc.

Dr. E. L. Whitney considered "Differential Diagnosis of Diabetes." He warned against the use of alkalies except those found in certain foods. Many errors in diagnosis are due to defective reagents used in chemical tests.

### YAKIMA COUNTY MEDICAL SOCIETY

Pres., P. J. Lewis; Secty., R. L. Ross

Yakima County Medical Society held a monthly meeting at Yakima May 14. The special feature of the meeting was the attendance of six physicians from Walla Walla Valley Medical Society and a group from Spokane County Medical Society. Six members from Walla Walla went by airplane to Yakima as guests of the Standard Oil Company of California in a trimotored plane which arrived the evening before from San Francisco. The Walla Walla passengers were Drs. I. T. Rooks, C. J. Johannesson, Elmer Hill, R. W. Smith, G. C. Daniel and Harry Flower of Milton, Ore. Several doctors from Spokane and other cities arrived by the old style "horseless carriage," as the flying doctors termed them. The journey from Walla Walla to Yakima consumed seventy-four minutes, eighty minutes being required on the return trip.

The scientific meeting was preceded by a dinner at the Commercial Hotel. The program consisted of papers by Drs. C. B. Ward, president of the Spokane County Society, and C. W. Countryman, a member of the same.

## IDAHO

### POCATELLO MEDICAL SOCIETY

Pres., D. C. Ray; Secty., W. F. Howard

Pocatello Medical Society held a meeting May 8 at Pocatello.

The following program was presented:

"Tularemia in Idaho." Dr. D. L. Alexander, Twin Falls.

"Head Injuries." Dr. John F. Coughlin, Twin Falls.

### SOUTH SIDE MEDICAL SOCIETY

Pres., W. F. Passer; Secty., H. N. Leete

South Side Medical Society held a meeting at Buhl April 30.

The program of the meeting presented the following papers:

"Tuberculosis in Children with X-Ray Films and Lantern Slides and Tissue Demonstration." Dr. Harold Nokes, Boise.

"The Early Diagnosis of Pulmonary Tuberculosis." Dr. W. W. Stalling, Boise.

"Tick Fever." Dr. C. F. Zeller, Jerome.

A joint meeting of South Side and Pocatello Societies was held at Rupert, May 27.

The program consisted of a Symposium on Fractures of the Skull, the following papers being read.

"Anatomy and Incidence." Dr. W. L. Alexander, Twin Falls.

"Diagnosis." Dr. C. R. Scott, Twin Falls.

"Eye and Ear Symptoms." Dr. Charles Wetherbee, Twin Falls.

"Treatment." Dr. J. F. Coughlin, Twin Falls.

## BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Trauma, Disease, Compensation. A Handbook of Their Medico-Legal Relations. By A. J. Fraser, M.D., Chief Medical Officer, Workmen's Compensation Board, Winnipeg. 524 pp. $6.50. F. A. Davis Co., Philadelphia, 1930.

This book consists chiefly of a compilation of opinions of various authors concerning the causative relation of trauma to disease. In this respect it is a distinct contrast to publications descriptive of symptoms, clinical or pathologic findings which are direct result of trauma. The first chapter deals briefly with an outline of workmen's compensation laws in general, and in some instances their operations are illustrated by citing court decisions. There is an inescapable impression that often these decisions, based only upon the admissable evidence presented and an interpretation of the law, were contrary to commonly accepted opinions arrived at by the scientific medical evaluation of symptoms, supported by clinical and laboratory evidence and a knowledge of the basic sciences.

In the following chapters practically all classified diseases of each system of the body are referred to, and it is a rare exception to find a simple disease in which trauma is not ascribed by some author as a direct or contributing cause in the development or causation of its symptoms. Occasionally contrary opinions are also cited. The following diseases are illustrative: chorea, auricular fibrillation, leukemia, pernicious anemia, cysts of the stomach, diabetes, psoriasis, etc. The author expresses no personal opinions, but one is impressed from the text that every known disease may be directly or indirectly influenced by trauma.

The meaning of trauma or injury is not defined and, as used in some quotations, is susceptible of broad interpretations It appears that trauma is a word with a very broad meaning which would be more descriptive if used with some qualifying adjective. It seems to be a fundamental human characteristic to seek compensation for physical misfortune, and often the only contacting evidence is the chronological development of symptoms. The chapter on the rating of permanent disability is instructive and helpful, although necessarily modified by the workmen's compensation laws of the various states. Except for the fact that the opinion of a writer upon a medical subject gives no stamp of authority, this book should serve a useful purpose to those interested in litigation arising out of personal injuries. Dudley.

Partnerships, Combinations and Antagonisms in Disease. By Edward C. B. Ihotson, M.D. (Lond.), B.S., Fellow Royal Society of Medicine, London. 348 pp. $3.50. F. A. Davis Co., Philadelphia, 1929.

The author states that old inexact conception as to diathesis, infection, immunity, etc. have been revolutionized by researches in physics, biochemistry and bacteriology. An attack of a disease may either make a patient more susceptible to another disease or raise his resistance to it. Every practitioner has seen illustrations of this fact. Whether or not disease is hereditary has long been subject to discussion. All are agreed, however, as to the tendency or diathesis toward disease. The diatheses are mostly defects or abnormalities in animal chemistry, being practically all hereditary or familial. It is known that different pathogenic germs are capable of growing together in the same culture medium. For instance, it is rare to find the influenza germ unaccompanied by others. So one often observes one disease associated with or followed by another, as tuberculosis as a sequel to influenza. The antagonism between malaria and tertiary syphilis is well known. It was observed that African natives on the Congo were universally afflicted with syphilis but rarely, if ever, presented paresis, while all at the same time were victims of malaria. This fact lead to the treatment of tabes and paresis by the inoculation with malaria germs. It is believed that the fever thus caused forms a protein which banishes the spirochete from the highly complex phosphuretted protoplasms of the nerve centers. The interrelations of heart, lungs, skin and kidneys are discussed and the sequence of diseases of each of these organs. The interrelations of the endocrine diseases is a matter of common observation. One interested in the subject of combinations and antagonisms in disease will find much of interest in this volume.

Uterine Tumors. By Charles C. Norris, M. D., Professor of Gynecology and Obstetrics and Director of the Department, University of Pennsylvania, etc. 251 pp. $3.00. Harper and Brothers, New York and London, 1930.

The author states that at the hospital of the University of Pennsylvania during twenty years, twenty per cent of gynecologic specimens have been of uterine tumors. Carcinoma of the cervix is the most frequent new growth occurring below the waist line. Prophylaxis and early diagnosis are particularly stressed in this monograph, operative technic being largely omitted. Chapters are devoted to polyps, malignant tumors of the cervix, carcinoma of the fundus, myoma uteri, sarcoma and other tumors of the fundus and tumors of the chorion. This handy volume offers useful information on these subjects.

Clinical Obstetrics. By Paul T. Harper, Ph.B., M.D.. Sc. D., F.A.C.S. Fellow of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, etc. Illustrated. 629 pp. $8.00. F. A. Davis Company, Philadelphia, 1930.

This is not intended as a standard textbook but rather a source of intimate information, dealing particularly with abnormal problems and situations which later demand instant and perfect familiarity with correct principles of handling rather than complete technic in the hands of an individual operator. The illustrations are entirely schematic and are not only plentiful but also a very helpful aid in demonstrating the mechanics of each individual problem. Bandl's ring is well discussed in a fairly short but intensely interesting chapter. The author differs boldly from accepted statistics, regarding primary occiput posterior positions. The truth of his figures will be accepted by a large number of obstetricians. The latest information is given regarding the treatment of the toxemias of pregnancy both early and late.

The chapters dealing with forceps delivery, breech presentation with management, version, cesarean section, placenta previa and puerperal sepsis are well worth reading, although no radical departure from well accepted principles are offered. The book contains valuable facts, originating in the experience of the author and presented in language that makes reading both easy and interesting.

W. M. O'Shea.

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The Treatment of Skin Diseases. By Noxoy Toomey, M.D., B.A., F.A.C.P., Late Instructor in Dermatology St. Louis University, etc. 512 pp. $7.50. The Lister Medical Press, St. Louis, 1930.

This book is an excellent supplement to the author's previous volumes, and is limited entirely to cutaneous therapeutics which are largely the result of personal experiences, obtained with a large number and variety of cases over a period of fifteen years. The subject is dealt with in a highly interesting manner and considers treatment both from the standpoint of general as well as dermatologic point of view. It is of equal value to the general physician as well as the dermatologist, and should enable any physician to handle successfully the large majority of skin diseases which he most commonly sees in practice. For the darmatologist it presents a short, concise, personal viewpoint, as an adjunct to his own ideas of therapy.

Parker.

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Cancer of the Breast. By William Crawford White, M.D., F.A.C.S., Junior Surgeon at the Roosevelt Hospital, New York, etc. 221 pp. $3.00. Harper and Brothers, New York and London, 1930.

This monograph offers the essential facts concerning cancer of the breast. Anatomy, physiology and pathology are briefly considered. Differential diagnosis must be made from hematoma, acute fat necrosis, cystic mastitis, adenofibroma, sarcoma, tuberculous abscess, gumma and lipoma. The author commends radium for the inoperable cases which may reduce the size of the growth and promote the comfort of the patient. He is not enthusiastic, however, as to the future of radium therapy in breast cancer. He describes the most useful, orthodox procedures, briefly presenting the essential features. He has had no experience with the electrosurgical knife, but offers some theoretical criticism not in accordance with the views of surgeons experienced with this form of operating. This is a convenient volume, offering the essential features of the condition under discussion.

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Obstetrics for Nurses. By Joseph B. DeLee, M.D., Professor of Obstetrics and Gynecology, University of Chicago, School of Medicine; Obstetrician to the Chicago Lying-in Hospital and Dispensary. New (9th) Edition, Revised. 12mo of 645 pages, with 269 illustrations. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $3 net.

The importance of this work in the field of obstetrics is attested by the appearance of nine revised editions in the past twenty-six years with numerous additional reprints, the last revision having appeared three years ago. Obsolete material and illustrations have been omitted in this volume and many new pictures have been added. The profusion of illustrations, plain and colored, add much to clarify and emphasize the text. Stress is placed on the care of confinement at home, where it is estimated 75 per cent of babies are still delivered in spite of the popularity of hospital service. The principles involved in hospital care, however, are emphasized for home treatment. The chapter on infant feeding has been rewritten by Abt and Feingold, which assures this chapter being thoroughly up to date. The chapter on obstetric complications details minor and grave disturbances of pregnancy, a careful perusal of which should aid the nurse in the early detection of possible serious pathology. The chapters on hygiene of pregnancy and care during the puerperium contain invaluable instructions, the reading of which will benefit any obstetric nurse. Chapters on delivery, obstetric operations and complications will be profitable reading for the obstetrician, presenting concisely the important features of this branch of obstetrics. This is a standard work in this line of nursing and practice.

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Gynecology for Nurses. By George Gellhorn, M.D., F.A.C.S., Professor of Gynecology and Obstetrics and Director of the Department, St. Louis University, School of Medicine, St. Louis, Mo. 12 mo. of 275 pp with 145 illustrations. W. B. Saunders Company, Philadelphia and London, 1930. Cloth, $2.00 net.

The successful nurse needs a certain amount of information relative to the specialties in order to cope successfully in the care of the patient who may need particular attention when suffering from an unusual form of disease. She should have a mental picture of the pathology and symptomatology of the disease with which she is dealing. This book presents such a conception of gynecology and will give the nurse valuable information concerning illness in this branch of practice. Part I discusses female genital organs in health and disease. Abundant illustrations amplify the text. Part II deals with gynecologic nursing. While treatment and administration by the gynecologist are not under consideration, the various procedures which the nurse may employ to benefit the patient are clearly described. At the end of each chapter appears a series of questions which the attending surgeon can utilize to enlighten the nurse, if he so desires.

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Merck's Index. (Fourth Edition). An Encyclopedia for the Chemist, Pharmacist and Physician. 585 pp. $5.00 with Discount of 50 per cent ($2.50) to physicians. Merck & Company, Inc., Rahway, N. J.

This volume gives the names and synonyms; source, origin, or mode of manufacture; chemical formulas and molecular weights; physical characteristics; melting and boiling points; solubilities; specific gravities; medical action; therapeutic uses; ordinary and maximum doses; incompatibilities; antidotes; special cautions; hints on keeping and handling, etc., of the chemicals and drugs used in chemistry, medicine and the arts, together with an appendix containing reactions of the more important alkaloids and glucosides; characteristic reactions of acids, bases, metals, and salts; table of atomic weights; thermometric equivalents; specific gravity tables; metric conversion tables; and abbreviations. More than twenty years have elapsed since the previous edition of this volume was published, due largely to interruption to the work during and following the World War. Its scope has been much en-

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larged, much newer and more important material having been added. It contains a wealth of information regarding drugs which are arranged alphabetically, the data concerning each being concise and at the same time complete. The publishers hope that it will meet the needs of the student, of apprentice and the young man on the threshold of his career.

DIABETES. Directions for Treatment by Insulin and Diet. By Benjamin F. Smith, M.D., Physician and Lecturer to St. Joseph's Infirmary, etc., Houston, Texas. 223 pp. D. Appleton and Company, New York and London, 1930.

The purpose of this manual is to impart information to diabetics concerning proper diets. Its special feature comprises tables of diets so arranged that the carbohydrate content may be changed without changing the protein or caloric value. There is a chapter on general considerations of diabetes, a brief description of insulin and its administration, followed by instructions to patients regarding collection and examination of urine and particulars about the arrangement of food. There are presented in detail two hundred and fifty-two diets with suggestions as to their use. A chapter on substitute foods specifies the values to be obtained by exchanging one food for another. This manual should prove useful to patients suffering from this disease.

SURGICAL CLINICS OF NORTH AMERICA. (Chicago Number—April 1930.) Vol. 10, No. 2, 252 pp., with 79 illustrations. Paper, $12.00 per clinic year; Cloth, $16.00 per clinic year. (Issued serially, one number every other month). W. B. Saunders Company, Philadelphia and London.

This volume presents clinics from many well known surgeons in Chicago, dealing with familiar as well as uncommon surgical conditions. Speed describes the removal of a fibrosarcoma from the right chest wall, involving the removal of sections of the sixth to tenth ribs, a portion of pleura, diaphragm, peritoneal surface, as well as separating adhesions from right lobe of liver. Although the lung was exposed and a portion of the diaphragm removed, the patient made a good recovery except for abdominal hernia remaining. This operation was performed six years ago and there has been no recurrence. Success seemed to endorse the extensive section which was performed. Bettman reports a clinic on Meckel's diverticulum, including operation for volvulus, a case of fecal impaction due to diverticulum and a description of two symptomless diverticula. He warns against a hasty removal of the diverticulum. There are many other instructive reports in this volume.

NEW TYPE OF FOREIGN BODY IN URINARY BLADDER. Dorrin F. Rudnick, Chicago (*Journal A.M.A.*, May 17, 1930), reports a case which is unique and worth calling attention to in view of the sudden flood of contraceptive methods and instruments into the hands of the laity. An intelligent white woman, aged 22, married, was requested to call at the Medical Bureau of Information on Birth Control located at 190 North State Street, Chicago. When she arrived at the office mentioned, some woman, presumably a nurse, entered into a lengthy discussion with her on birth control, its desirability and the various means of accomplishment. The combined method of a jelly plus a rubber diaphragm was recommended as the safest. She was impressed with the idea and bought a rubber diaphragm contraceptive for $3. The nurse then gave her instructions on how to insert it, which cost an additional $3, and a prescription for contraceptive jelly which she purchased at a designated drug store. At her first attempt to insert the rubber diaphragm at home, the patient experienced difficulty. It caused considerable pain and the patient, feeling that something was wrong, attempted to remove it but could not find it. This occurred on Saturday. By Monday she was suffering frequency of micturition, suprapubic pain and pain at the end of urination. Cystoscopy readily revealed the grayish rubber pessary. An urethral speculum was inserted, and the bag was located, grasped and extracted by means of Allis pick up forceps. The author asserts that possibly other foreign bodies in the female bladder, such as catheter tips and chewing gum, have been introduced there in ill advised attempts at prevention of conception.

PLAUT-VINCENT'S INFECTION OF VAGINA. Clement H. Arnold, San Francisco (*Journal A. M. A.*, May 10, 1930), has treated twenty or more cases of Vincent's angina of the mouth. In twelve of these agranulocytosis, anemia, hemorrhage of greater or less degree, decreased blood platelets and in one case death from thrombosis have been accompanying features. Not all the patients presented these factors, but all those with sufficient fever and constitutional symptoms to be ordered to bed did so. Treatment consisted of a combination of sodium perborate as a mouth wash and buccal paste, and neoarsphenamine; in two cases sulpharsphenamine was given intramuscularly. There were no recurrences except in one case, in which the occupation of the patient (traveling salesman) made persistent treatment almost impossible. He is now well, however. All patients are advised to continue the sodium perborate for an indefinite period and to return periodically for smears. Arnold also reports a case of Vincent's disease of the vagina which followed that of the mouth. An agranulocytosis was present in this condition similar to that in other cases restricted to the mouth. The exact pathologic-hematologic-clinical relationship is not yet perfectly understood The condition is contagious and should be given prompt and continued intensive treatment. Because of its contagiousness, patients should be partially isolated and their personal possessions, such as handkerchiefs, napkins and table utensils, kept separate and sterilized. Women are apparently more seriously affected than men. A further field for study is indicated as to the possible causal relationship between certain idiopathic agranulocytic blood states and cryptic Vincent's angina in other parts of the body than the mouth. This is the only case of Plaut-Vincent's infection of the vagina that Arnold has been able to find in the literature for the last thirty-five years. Evidence presented indicates that the fusiform bacilli and spirilla are different forms in the life cycle of one organism.

TRANSMISSION OF HEMOPHILIA. C. A. Mills, Cincinnati (*Journal A. M. A., May* 17, 1930) reports a bleeder family. Two sisters, unaffected, had each two sons, all four boys being bad bleeders throughout life. The family tree of the descendants of only one of these four boys is available. This one married a woman who was in no way related to him and who had no known bleeding in her family. Throughout the subsequent history of the family there were no marriages with outsiders who were in any known way connected with the disease. This family was the only one in that locality with hemophilia. Yet among the thirty-one female and twenty-five male known descendants of this one hemophilic man there were eight males with undoubted hemophilia and three open to question. No females were affected, but transmission, except in the one instance, was always through them. In two instances the disease passed through two generations of females to appear in the males of the third generation.

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## ORIGINAL CONTRIBUTIONS

### INTRAHEPATIC JAUNDICE*

Albert M. Snell, M.D.,
and
Ferdinand M. Jordan, M.D.,
rochester, minn.

In the last twenty years there has been readjustment of general conceptions of the hepatic diseases, particularly of those associated with jaundice. The older views on the pathogenesis of jaundice have not been found entirely tenable in the light of recent physiologic studies. In medicine, however, obsolete theories have a strange vitality; they crop up in textbooks and in practice, and are exceedingly difficult to supplant. This is particularly true in the clinical study of jaundice. Many practitioners still believe that jaundice is essentially an obstructive phenomenon. This view, originally advanced by Eppinger, still has a profound effect on the treatment and advice given to jaundiced patients. The idea that jaundice may be obstructive, hemolytic or due to functional derangement of the hepatic cells, has been introduced into medical practice only with difficulty.

It is generally known that bilirubin, the pigment which causes the visible signs of jaundice, is formed from broken-down hemoglobin, and that it is brought to the liver for excretion. Mann's experiments on hepatectomized dogs have established this point beyond question. The site of transformation of hemoglobin into bilirubin is probably in the reticuloendothelial cells of the bone marrow, spleen, and liver; the normal pathway of excretion of bilirubin is by way of the polygonal hepatic cells. Bilirubin behaves as a threshold substance in the human being, for normally a small amount of it is present in the blood stream.

On the basis of this theory of metabolism of bilirubin, McNee has evolved a theory of jaundice which correlates well the clinical facts and experimental data now available. By schematic representation of the lobule of the liver he has demonstrated the possibilities of pathologic interference with formation and excretion of normal bile pigment. He regards the polygonal hepatic cells as forming a tubule with a blind end, the free end passing into a bile capillary. Surrounding each tubule lie hepatic vascular capillaries, lined with Kupffer cells of the reticuloendothelial system, and carrying blood from the portal to the central and thence to the hepatic vein.

Jaundice may be produced in one of three ways. If the biliary passages are occluded, bilirubin which has passed through the vascular channels and polygonal cells of the liver is reabsorbed by the blood stream and lymphatics. This type of jaundice is described as obstructive. If there is an abnormally large production of bilirubin or its precursors within the body, or if there is an impediment to the passage of this substance through the endothelial lining of the hepatic capillaries, bilirubin will accumulate and enter the general circulation without being passed through the hepatic cells proper. This type of jaundice is referred to as hemolytic. Finally, if there is hepatic injury, functional or otherwise, not only may normally formed bilirubin fail of excretion, but also that which has passed through the polygonal cells of the liver may be reabsorbed. This is the type of jaundice described as toxic or infectious. McNee, therefore, proposes that jaundice be classified into three clinical varieties: obstructive, hemolytic, and toxic or infectious.

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* Division of Medicine, The Mayo Clinic. Abridgment of paper read before King County Medical Society, Seattle, Wash., March 3, 1930.

Regarding obstructive jaundice, little needs to be said. It is due to occlusion of the larger biliary passages by carcinoma, calculus or cicatrix, and presents a group of well defined clinical pictures. Hemolytic jaundice, which is to be classified as a disease of the reticuloendothelial system rather than of the liver, is also a well established clinical entity. In the third group, which comprises toxic or infectious jaundice, there is a variable clinical and pathologic picture; it is with this heterogeneous collection, which may be conveniently grouped under the general heading of intrahepatic jaundice, that this paper is concerned.

Before entering into a clinical consideration of this group of cases, it is well to recall what is known of their pathology. It has been said that any condition which will produce functional derangement, degeneration, atrophy or inflammatory change in a sufficient number of hepatic cells will produce jaundice. The pathologic picture of intrahepatic jaundice may very, therefore, from the simple cloudy swelling seen in the infectious fevers to the actual necrosis of hepatic cells which is encountered in acute or subacute yellow atrophy. The whole range of lesions which are designated by the term hepatitis may also be considered, as well as the degenerative change produced in the liver by chronic passive congestion. In the more chronic forms of hepatitis, or in the chronic, degenerative hepatic changes of cirrhosis, the general destruction or disorganization of the hepatic parenchyma will lead to functional insufficiency and jaundice. Finally, one must include the lesions caused by the biliary infection and back-pressure which remain even after the relief of obstructive lesions of the larger bile passages. In actual practice only the more severe pathologic lesions are encountered, since recovery in the others takes place spontaneously; in the fatal cases the liver is the site of a variable mixture of inflammatory and degenerative changes, usually accompanied by some reparative processes which may take the form of nodular hyperplasia (fig. 1). In the majority of cases the portal spaces and bile capillaries are only secondarily affected.

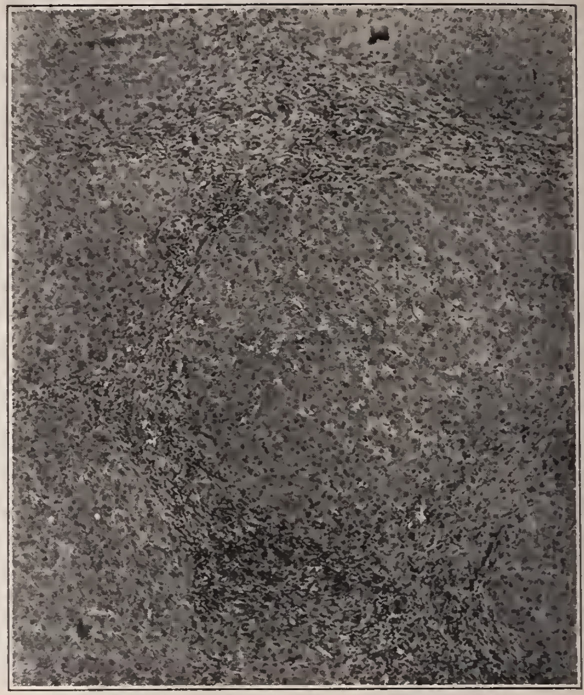

Fig. 1. Subacute diffuse hepatitis (x 75).

The mechanism by which these changes produce icterus is not altogether clear. The French school has attributed the retention of bile pigments to changes in the hepatic cells, whereas the Germans have followed Naunyn in regarding cholangitis of the finer bile passages as the probable cause. McNee feels that both types of lesion are present and that one or the other may predominate in the individual case or at different periods in the same case. From the foregoing it is apparent that in intrahepatic jaundice any obstruction to the excretion of bilirubin occurs in the fine structures of the liver, that is, in the hepatic cells and bile capillaries, rather than in the larger bile passages.

The classification of many of the clinical types of intrahepatic jaundice is a difficult problem. Any attempt to group these cases on the basis of pathologic change is obviously impractical; the same may be said of any division made on the basis of clinical syndromes, since both the clinical and pathologic features in any given case may vary greatly at different periods. Classification on an etiologic basis appears to present many advantages. The clinical classification of intrahepatic jaundice seems to resolve itself, therefore, into a grouping of the poisons, inflammatory processes and degenerative changes which may affect the hepatic parenchyma. The following classification, although by no means free from objections on practical and theoretic grounds, is a convenient one for clinical use.

A. Infectious jaundice.
  I Epidemic or catarrhal (including campaign jaundice.).
  II Diffuse hepatitis (parasitic).
  III Spirochetal (Weil's disease, syphilis).
B. Toxic jaundice, caused by drugs, industrial poisons and disease.
  I Caused by drugs.
    1. Arsenic, organic and inorganic.
    2. Cinchophen (atophan), oxyl iodide, and so forth.
    3. Chloroform, carbon tetrachloride.
    4. Yatren.
  II Caused by industrial poisons.
    1. Phosphorus, picric acid.
    2. Arsenic.
    3. Trinitrotoluene (TNT), tetrachlorethane in "airplane dope," toluylendiamin.
    4. Arseniuretted hydrogen.
  III Caused by systemic disease.
    1. Exophthalmic goiter.
    2. Pneumonia, sepsis, typhoid fever, yellow fever, dysentery, relapsing fever.
    3. Toxemia of pregnancy.
C. Jaundice of circulatory origin.
  I Chronic passive congestion (cirrhose cardique).
D. Jaundice from inflammatory and suppurative processes.
  I Cholangitis (usually secondary to previous obstruction of the biliary tract).
  II Pylephlebitis.
E. Jaundice associated with hepatic cirrhosis.
  I Portal.
  II Biliary and mixed types, chiefly secondary to obstruction.
F. Acute or subacute yellow atrophy.
  I Primary.
  II Secondary to many of the above mentioned conditions.

The frequency with which intrahepatic jaundice is encountered in practice is not generally known. Hartman, in reviewing a series of 400 cases seen at The Mayo Clinic, found that intrahepatic types of jaundice represented about 25 per cent of the total group. This figure undoubtedly would be higher in individual practice, where one would probably see a greater number of cases of epidemic or catarrhal jaundice.

In examining the records of the gastrointestinal cases at St. Mary's hospital for the last three years, we have found more than fifty cases of proved intrahepatic jaundice, doubtful and ambulant cases being excluded. In our experience the more common types seem to be: (1) epidemic or infectious jaundice, (2) jaundice from drugs, chiefly cinchophen and arsphenamine, and (3) jaundice associated with various types of hepatic cirrhosis. Of thirty-three cases which we have recently analyzed in detail, it was found that in ten the disease was of infectious origin; in ten it was due to portal or biliary cirrhosis; in six to arsphenamine or syphilis; in three to cinchophen, oxyl iodide or other antirheumatic remedies; in one case to toxemia of pregnancy; in one to an unknown origin; and in two cases it was secondary to previous obstruction of the common bile duct.

The clinical picture of intrahepatic jaundice is extremely variable. A full account of the many clinical syndromes included in this group is beyond the scope of this paper. However, there are some features which distinguish this group from other types of jaundice, and which serve as a background for the reports of cases which are to follow.

In most cases the onset of jaundice is insidious and painless. Pruritus is often a prodromal symptom, especially in jaundice due to drugs; in the epidemic forms there may be initial gastrointestinal disturbances, general malaise and slight fever. Severe symptoms or colicky abdominal pain have been uncommon in our cases. At the onset there may be suppression of the flow of bile, with clay-colored stools and dark urine; this condition may persist for a variable period, but in practically all of our cases a free flow of bile has been obtained on either the second or third attempt at duodenal drainage. This may perhaps be due to the fact that very few acutely jaundiced persons are seen at the clinic; most of them have had symptoms over a period of at least two or three weeks before their registration.

The curves of serum bilirubin are more or less characteristic of the various types of intrahepatic jaundice, and, therefore, are of some diagnostic importance. In epidemic or infectious jaundice the serum bilirubin reaches a high level and subsides gradually as the flow of bile is established. In acute or subacute atrophy of the liver a high and slightly fluctuating level of serum bilirubin is noted; only rarely is there a tendency for the serum pigments to decrease in amount. In the various types of portal and biliary cirrhosis, and in other types of chronic hepatitis, the values for the serum bilirubin are much lower, and vary only slightly from day to day unless acute atrophy supervenes. Concerning congestive lesions, the same statement also applies.

The essential characteristics of intrahepatic jaundice are, therefore: (1) a history of some etiologic factor, (2) painless jaundice, often without other serious symptoms except prostration and malaise, (3) evidence of patent biliary passages, as indicated by the presence of bile in the stools and duodenal contents, and (4) curves of serum bilirubin more or less characteristic for the particular type of hepatic lesion. The following reports of cases are illustrative of these points.

Case 1. *Infectious or catarrhal jaundice.* A man, aged forty-five years, came to the clinic in August, 1929. Three months previously he had begun to lose weight, and had suffered from mild, indefinite indigestion. Six weeks later he had had nausea and mild general malaise, and shortly afterward had become jaundiced. The jaundice had gradually increased in intensity and the stools had been rather light in color.

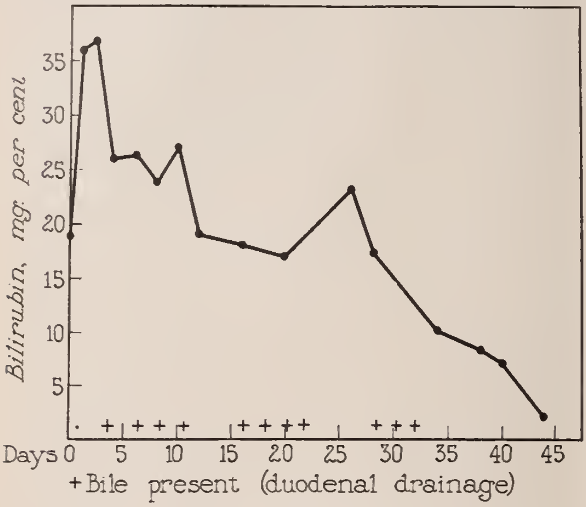

Fig. 2. (case 1). Serum bilirubin curve and results of duodenal drainage in infectious jaundice.

The patient was found to be deeply jaundiced, the liver was moderately enlarged, and the spleen was just felt at the costal margin. On duodenal drainage, free flow of bile was obtained. The curve of serum bilirubin is shown in figure 2. It will be noted that on all occasions there was a free flow of bile when the duodenal tube was introduced. In spite of this, more than six weeks passed before the patient's jaundice entirely disappeared. At the conclusion of his illness the liver and spleen were still very much enlarged. On examination, two months later, however, they had returned to normal size. During the entire course of his illness there were no evidences of renal or hepatic insufficiency, and at no time was there any tendency toward hemorrhage. Careful roentgenologic examination of the gastrointestinal tract gave negative results, and on reexamination no evidence was found of any systemic disease that might produce jaundice of this type.

Comment. This case represents a relatively severe type of infectious jaundice. The ordinary duration of this disease is about six weeks and most of the patients are young persons or children. However, older persons are not immune and the disease may run a much more prolonged course and may be unusually severe. The extent of the pathologic lesions in the liver is not known, since so many of the patients recover. However, the lesions must be fairly extensive, since a number of cases are on record in which jaundice of this type has been followed by definite signs of portal obstruction. Jones, Weir and others have reported such cases. If in the patient whose case has just been reported, any signs of hepatic cirrhosis should develop subsequently, it probably would be necessary to regard the illness just described as an etiologic factor.

Particular attention should be called to the occurrence of this type of epidemic jaundice in older persons, in whom it easily may be confused with jaundice due to neoplasm. We have seen at least two definite cases in physicians; one was aged fifty-three years, and the other sixty-five years. Both recovered completely and permanently.

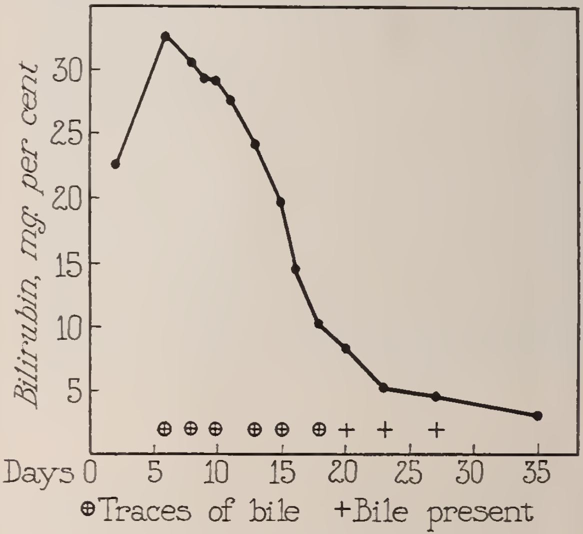

Fig. 3 (case 2). Serum bilirubin curve and results of duodenal drainage in arsphenamine jaundice.

Case 2. *Arsphenamine jaundice.* A man, aged forty-four years, registered at the clinic in July, 1927. He gave a history of syphilis acquired about six years earlier, and stated that he had had much treatment since, including a good many injections of arsphenamine. The last arsenical treatment which he had received had been given about three months before he came to the clinic. Five weeks before his registration, indefinite soreness and tenderness in the epigastrium had developed. This had been followed by deep jaundice and much pruritus. For a period of several days his stools had been clay-colored and the jaundice appeared to be deepening.

Nothing significant was found on examination except a slightly enlarged and somewhat sensitive liver. The first reading of serum bilirubin was 22.7 mg. for each 100 c.c. Duodenal drainage was performed several times and only small quantities of bile were obtained, but finally a free flow of bile was noted. Figure 3 shows the curve of serum bilirubin in this patient and the results of duodenal drainage. The patient recovered and there was no evidence of residual hepatic injury.

Comment. The exact nature and significance of arsphenamine jaundice has never been definitely settled. It has been held by many competent observers that this type of jaundice is due to the direct effect of arsphenamine on hepatic cells previously injured by the toxins of syphilis. Others have regarded the condition as being due to an infectious process similar to epidemic jaundice which merely happens to occur in the course of treatment with arsphenamine. Good evidence has been offered on both sides of this controversy, but the authorities who regard the disease as being due to arsphenamine seem to have somewhat the better of the argument. From a clinical standpoint the condition is practically indistinguishable from ordinary epidemic jaundice. It may have the same sequelae and may progress to chronic hepatitis or cirrhosis. Acute yellow atrophy has been described as a late development and is said to occur more frequently in cases which develop some time after treatment has been discontinued. In most instances the condition can be distinguished from epidemic jaundice only by the history and presence of arsenic in the urine, stools and hair.

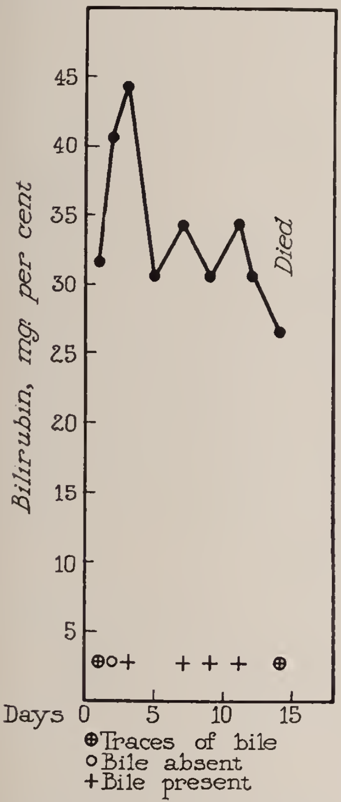

Fig. 4 (case 3. Serum bilirubin curve and results of duodenal drainage in subacute yellow atrophy due to cinchophen poisoning.

It must not be forgotten that inorganic arsenic may be responsible for hepatic injury or jaundice. Two cases were reported from the clinic some time ago, and since then another case of chronic arsenical poisoning has been seen in which jaundice was a prominent factor. In any cases of jaundice of doubtful origin signs of poisoning by either inorganic or organic arsenic should be carefully sought.

Case 3. *Subacute yellow atrophy due to derivatives of cinchophen.* A woman, aged fifty-seven years, registered at the clinic in July, 1929. She had suffered from senescent arthritis for several months prior to admission and had taken a proprietary preparation of cinchophen intermittently during this period. On several occasions she had had pruritis which had caused her temporarily to discontinue taking the drug. Ten days prior to admission, deep, painless jaundice developed.

The only striking features in the case were evidences of senescent arthritis and deep jaundice. The curve of serum bilirubin is shown in figure 4. It will be noted that there was a free flow of bile on duodenal drainage on four occasions. In spite of this, the jaundice did not decrease in any material degree and the complete picture of subacute yellow atrophy developed rapidly. Death occurred fifteen days after admission. The patient sank into a typhoid state and finally into coma. At necropsy marked necrosis of the liver was found.

Comment. Jaundice from cinchophen and other remedies that are used in rheumatic conditions recently has received much attention. There are perhaps fifty cases in the literature, and more are being encountered daily. Cases have been described both in this country and abroad. Hanzlik stated that the toxic effect is probably due to the quinolin radical which is present in most of these compounds, and which is a cellular poison. The development of the atrophy of the liver in these patients appears to be due to personal idiosyncrasy rather than to any particular fault in the drug itself. Not all of the cases are fatal; a few recoveries have been observed, but in general the mortality in this group of cases has been exceedingly high. We have recently noted two patients in whom recovery apparently followed jaundice of this type.

Case 4. *Intrahepatic jaundice caused by antirheumatic drugs; recovery.* A man, aged forty-two years, came to the clinic in August, 1928, complaining of severe generalized arthritis apparently of infectious origin. Infected teeth and an indeterminate degree of prostatitis were found at examination, and treatment was advised. He returned to the clinic in July, 1929, feeling much worse and with extensive infectious arthritis. He had had strenuous treatment with vaccine, intravenous administration of mercurochrome and physiotherapy at home, and he also had been given a large number of doses of sodium salicylate intravenously; this treatment had given him some relief and he had also taken other antirheumatic remedies, particularly derivatives of cinchophen, with benefit from time to time. He had been jaundiced over a period of six months; the first evidence of this condition had been noted while he was receiving treatment with sodium salicylate intravenously.

The patient was emaciated, moderately jaundiced and rather badly disabled by infectious arthritis. The liver and spleen were both palpable. Laboratory examinations were essentially negative, except for a concentration of serum bilirubin of 4.6 mg. for each 100 c.c. Duodenal drainage was done and a free flow of bile was obtained. He was advised to omit all drugs in the future and a diet high in carbohydrate was prescribed.

After the patient discontinued treatment of the arthritis with drugs, the jaundice slowly cleared and he has since reported complete recovery from this feature of the illness.

Comment. The evidence in this case all points to intrahepatic jaundice caused by antirheumatic remedies, which has subsided spontaneously on his stopping this form of treatment.

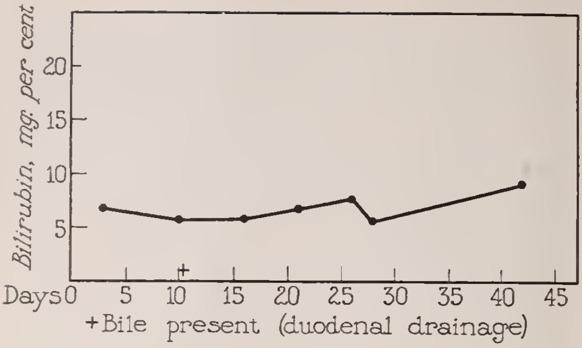

Fig. 5 (case 5). Serum bilirubin curve in portal cirrhosis.

Case 5. *Jaundice associated with portal cirrhosis.* A man, aged thirty-one years, registered at the clinic in January, 1927. He gave a history of having had dengue and malaria. His health had been fairly good prior to September, 1926. At that time diarrhea had developed, and had persisted for two months. This was followed by general malaise and deep jaundice, which persisted for about a month, and which gradually cleared up. After an interval of two weeks the jaundice recurred. There was no pruritis, but the stools were light-colored. During the course of the first attack of jaundice he had had a gastrointestinal hemorrhage, and had lost so much blood that three transfusions were required. He had had intermittent fever since the beginning of his illness and had lost a good deal of weight and strength.

The liver was considerably enlarged, very hard and apparently nodular. The spleen was slightly enlarged. There was no ascites. Laboratory examinations disclosed evidence of marked secondary anemia. The curve of serum bilirubin is shown in figure 5. Duodenal drainage was performed and a free flow of bile was obtained. The patient was under observation in the hospital for a period of twenty-four days. During this time the liver appeared to be gradually decreasing in size. Neither the visible jaundice nor the values for serum bilirubin showed any appreciable change during this period.

A diagnosis of intrahepatic jaundice, probably due to portal cirrhosis, was made, but because of the rather indeterminate nature of the ailment, exploration was decided on. Marked portal cirrhosis was found; the liver was considerably reduced in size, and was hard and irregular. The spleen was considerably enlarged, but because of the jaundice and the patient's poor condition, splenectomy was not considered advisable. He recovered fairly well after operation and was able to return to his home.

Comment. Jaundice is not ordinarily a striking feature of portal cirrhosis. It frequently occurs at the onset of the disease; its appearance at that time is designated as signal jaundice. It may also occur during the terminal stages of portal cirrhosis, and at that time probably represents a high degree of hepatic insufficiency. In many cases of portal cirrhosis there may be previous episodes of jaundice from which the patient recovers without incident. In our experience slight, constant jaundice, associated with an enlarged liver and spleen without ascites, has been fairly characteristic of this type of portal cirrhosis. The appearance of ascites or of a gastrointestinal hemorrhage may confirm the diagnosis. The jaundice is rarely as deep as that in true biliary cirrhosis, and there is usually much less pruritus. Jaundice and ascites are not as frequently associated in portal cirrhosis as one might expect, and when both are present the prognosis is grave.

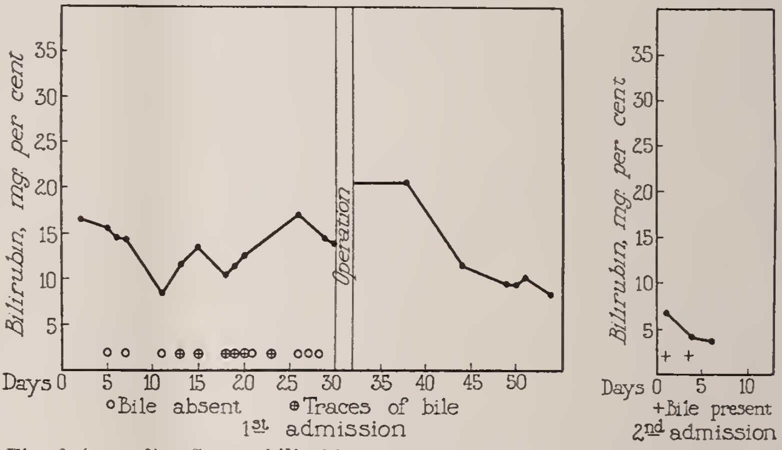

Fig. 6 (case 6). Serum bilirubin curve and results of duodenal drainage in biliary cirrhosis of the primary type.

Case 6. *Jaundice associated with biliary cirrhosis of the primary type.* A man, aged twenty-nine years, registered at the clinic in January, 1927. He gave a history of having had several previous attacks of jaundice which had occurred between the ages of twelve and twenty years. These attacks had lasted for from one to two months, and had been associated with some dull, aching pain in the right side. Five weeks before he came to the clinic definite jaundice and marked pruritis had developed. The stools had been definitely light in color and he had lost considerable weight and strength.

Nothing striking was found on examination except moderately deep jaundice and slight enlargement of the liver and spleen. There were no ascites and no visible collateral circulation. Duodenal drainage was done repeatedly; in about half of the instances bile was not obtained, and in the other instances only a moderate amount was noted. The curve of serum bilirubin and results of duodenal drainage are shown in figure 6. Because of the history of pain and the possibility of obstruction of the common bile duct, an exploratory operation was performed. The liver was normal in size and was deeply bile-stained. The spleen was about two and a half times normal size. The common bile duct was dilated, but actual obstruction was not found. Cholesterosis of the gallbladder also was noted, but there were no stones in the biliary tract. A tube was inserted in the common bile duct, and bile drained from it for a period of about three weeks. After operation there was profuse drainage of bile from the tube and the stools again resumed their normal color. The jaundice cleared up almost entirely, and the patient gained about thirty pounds in weight. Shortly afterward there was recurrence of the

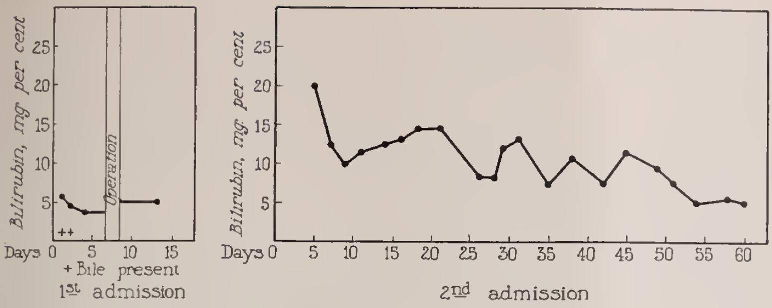

Fig. 7 (case 7). Serum bilirubin curve in biliary cirrhosis secondary to prolonged obstruction of the biliary tract.

jaundice which lasted three or four months. There was no pain at that time and he felt fairly well.

The patient returned in August, 1928, somewhat jaundiced and with a moderately enlarged liver. The concentration of serum bilirubin varied from between 3 to 6 mg., and a free flow of bile was obtained on duodenal drainage.

Comment. This case represents a fairly typical example of biliary cirrhosis of the infectious type. There appear to be two general types of biliary cirrhosis: an infectious variety in which the common bile duct is patent, and the infection centers largely around the intrahepatic bile passages, and a second type which follows prolonged obstruction of the extrahepatic bile passages and which is associated with hydrohepatosis, fibrosis and cholangitis. In obstructive cirrhosis much can be accomplished by removal of the obstruction to the bile passages, even after a good deal of permanent hepatic injury has occurred. In the infectious type prolonged external biliary drainage occasionally has given good results but in the main the condition continues to progress. In the original descriptions of this type of biliary cirrhosis it was stated that it was a disease of young persons. However, we have recently seen two elderly women, in whom this type of hepatic lesion was present without any demonstrable infection in the biliary passages. Exploration has been carefully carried out in both cases, and no evidence of obstruction of the biliary tract could be made out. The etiology and nature of this disease is not known, but it probably represents a particular type of progressive cholangitis and hepatitis.

Case 7. *Jaundice secondary to obstructive biliary cirrhosis.* A housewife, aged thirty years, registered at the clinic in June, 1929. She gave a history of gallstone colic, without jaundice, of nine years' duration. Cholecystectomy was performed in March, 1928, and was followed by persistent drainage of bile over a period of nearly two months. The patient then remained well for about five months, and then, after a single attack of colic, painless, fluctuating jaundice developed, with chills and fever.

The patient was moderately jaundiced and had an enlarged liver and spleen. A diagnosis was made of biliary cirrhosis secondary to stricture of the common bile duct, and operation was performed. The preoperative diagnosis proved to be anatomically correct. A T-tube was inserted in the common bile duct, and the patient progressed fairly well; bile appeared in the stools and also drained from the tube. About six weeks later she suddenly became much more jaundiced and a marked hemorrhagic tendency developed, with purpura, hematuria and epistaxis. She was readmitted to the hospital and remained there for about two months. The curve of serum bilirubin is shown in figure 7. During this whole period there was more or less continuous bleeding from various organs, and many transfusions were required to control bleeding and to compensate for the loss of blood. The stools were invariably normal in color and contained good quantities of bile. As the jaundice subsided, the patient gradually recovered, and when last heard from was in good general health.

Comment. In this case intrahepatic jaundice developed in a patient who had marked biliary cirrhosis of the obstructive type. The bile passages were patent throughout the course of the illness and the high degree of hepatic insufficiency and jaundice must have been due to injury to the hepatic cells. This condition has not received much attention, although Weir and Jordan have described a case, and in a patient recently seen at the clinic death ensued from this condition. At necropsy subacute hepatitis, with regions of necrosis, was found. The whole picture suggested an atypical form of acute yellow atrophy. It must not be forgotten that jaundice, occcurring in the patient who has previously had obstruction of the biliary passages, may not necessarily be due to obstruction alone, but may be traceable to infectious or degenerative changes in the hepatic parenchyma, developing as a sequel of such obstruction. In any case of long-continued obstruction to the common bile duct there may be an element of intrahepatic jaundice; in other words, there is enough serious injury to the hepatic parenchyma to produce jaundice of its own accord, without reference to gross obstruction of the extrahepatic biliary passages.

## PROGNOSIS

The outlook in the various types of intrahepatic jaundice obviously will vary with the etiologic agent and with the degree of hepatic injury which is present. In the epidemic or infectious types recovery is the rule; the possibility of acute atrophy developing in this condition, as well as the occasional sequel of portal obstruction, should not be forgotten. In the forms of jaundice which are due to chemical agents, recovery depends largely on the detection and removal of the offending agent. In arsphenamine jaundice the prognosis does not differ greatly from that of the infectious types; in most cases it subsides spontaneously, but in any case serious acute or chronic hepatic injury may develop. Acute or subacute yellow atrophy following the use of cinchophen has been almost uniformly fatal. In hepatic injury due to tetrachlorethane, trinitrotoluene and related compounds the prognosis is almost equally grave.

In the various types of portal and biliary cirrhosis, associated with a marked degree of jaundice, the outcome is usually unfavorable. In all types of intrahepatic jaundice one may observe certain characteristics of the response of the hepatic parenchyma to injury. Acute injury usually is followed by complete regeneration and repair, unless the pathologic process produces injury so extensive as to amount to almost complete destruction of the hepatic parenchyma. Chronic or repeated injury results in extensive fibrosis and in nodular hyperplasia which may in itself interfere greatly with hepatic function. The great amount of injury which the liver will tolerate without any obvious decrease in its functional capacity is well known to physiologists; experimental cirrhosis can be produced only with great difficulty, as Bollman and others have shown. The regenerative and reparative properties of the liver are so great that one can hardly regard any case of hepatic disease as being absolutely hopeless until coma and complete hepatic insufficiency appear.

## TREATMENT

There is no specific treatment for any type of intrahepatic jaundice, and even the palliative or symptomatic remedies which are available seem to be of doubtful benefit. In a majority of cases the course of the disease seems to be influenced little, if at all, by the therapeutic measures employed. The importance of recognizing and attempting to remove any possible etiologic factors already has been emphasized. In the case of chemical poisons this may in itself effect a cure. Certain general supportive measures also are of importance. The effect of diets high in carbohydrates has been described by many authors and needs no additional advocates. In general it may be said that in practically every known form of experimental hepatic lesion high intake of carbohydrate has been shown to exert a protective influence. Bollman's recent studies are particularly conclusive. He has shown in studies on experimental obstructive cirrhosis, and on cirrhosis from carbon tetrachloride, that the development of ascites can be prevented or controlled by feeding carbohydrate, whereas diets of protein have an exactly opposite effect. The death rate is also far greater in experimental animals which are fed protein than in those which are fed carbohydrate.

In acute or subacute hepatic insufficiency in the human being intravenous administration of glucose repeatedly has been shown to produce marked symptomatic improvement, and even apparent recovery, in certain cases. It has been of great value in our experience and should be instituted whenever signs of hepatic failure develop or when any case of intrahepatic jaundice takes an unfavorable turn. The use of insulin in connection with administration of glucose is still in the experimental stage, although many authorities recommend it. The utilization of glucose administered intravenously depends on so many factors, such as the concentration of the solution, the rate of administration and the state of the subject's nutrition, that the possible effect of insulin is very difficult to evaluate. Jordan's experiments illustrate this point. We have failed to see any advantage in giving insulin with glucose, although we are still investigating the subject. In Ravdin's recent review the whole question of metabolism of carbohydrate in hepatic disease is considered, and may be referred to for details and the literature on the subject.

To combat the toxemia of certain types of hepatic injury, calcium salts have been employed. The work of Minot and Cutler gives a sound experimental basis for their use. Administration of calcium is probably worthy of a more extended trial in other types of intrahepatic jaundice, although the mechanism by which it exerts its protective action is not known. Transfusion of blood in the presence of acute degenerative hepatic lesions may also diminish the toxemia, and the treatment may be used particularly in cases in which there is a hemorrhagic tendency. Transfusion is of greatest service in cases of intrahepatic jaundice secondary to prolonged biliary obstruction and cirrhosis, since the tendency to bleed is greatest in this group of cases.

The advisability of the use of various procedures to stimulate the flow of bile is another debatable point in the treatment of these patients. Duodenal drainage is of great value in diagnosis, since it offers conclusive evidence as to the patency of the biliary passages. Its therapeutic value is less certain, although there is evidence which seems to show that it may shorten the course of infectious jaundice or jaundice due to arsphenamine. If the patient does not object, it may be employed, but it probably is of no great value in treatment. The use of chologogues in intrahepatic jaundice is about comparable to the use of diuretics in nephritis; in the more acute forms they are contraindicated; in the more chronic types they may be used, but it is quite possible that they may do more harm than good. Decholin is a fairly efficient and nontoxic cholagogue and may ultimately prove valuable in certain types of cases; at the present time one should be cautious in its use and conservative in interpreting the therapeutic results obtained by it.

There are certain negative aspects to the treatment of intrahepatic jaundice which should be emphasized. It has previously been stated that in the minds of many physicians jaundice is primarily an obstructive phenomenon, and on that basis surgical intervention is frequently advised in jaundice secondary to lesions of the hepatic parenchyma. A recent article by Frangenheim is illustrative of this point of view. It is important to recognize this large group of jaundiced patients as largely suited to nonsurgical treatment. In the presence of painless jaundice with patent biliary passages there is little to be gained by surgical intervention. If operation is considered at all, as it may frequently be in doubtful cases, it is well to defer it until the acute stage of the jaundice has subsided somewhat. Many patients with acute intrahepatic jaundice will either present signs of subacute atrophy, or will be on the road to recovery within six weeks or two months of the time they are first seen; the remaining cases may or may not present a surgical problem which can be decided after observation for a sufficient period and evaluation of the clinical data.

The surgical treatment of the more chronic lesions of the hepatic parenchyma is at best difficult and somewhat unsatisfactory. Prolonged surgical biliary drainage is of value in the infectious type of biliary cirrhosis, and splenectomy also has been performed with benefit in this condition. In certain cases of portal cirrhosis splenectomy, or omentopexy by the Talma-Morison method, may be indicated, although such operations are primarily directed toward relief of the vascular lesions of cirrhosis rather than of jaundice. However, no surgical methods yet available can relieve acute hepatitis or a degenerative hepatic lesion, and in general, intrahepatic jaundice remains a medical problem except in a few isolated cases.

## CONCLUSION

"Intrahepatic jaundice" is a term used to designate a large group of cases, in which the cause of jaundice lies in injury to the hepatic parenchyma rather than to the extrahepatic biliary passages. This group includes a wide variety of hepatic lesions caused by infections, toxins of bacterial or unknown origin, chemical poisons and vascular lesions.

The clinical picture is essentially that of painless jaundice, patent biliary passages and curves of serum bilirubin more or less characteristic of the particular type of lesion.

The treatment of this group of cases is essentially by medical means. There are no indications for operation except in occasional cases associated with chronic biliary infection. Many forms of intrahepatic jaundice are self-limited and surgical intervention should only be considered after a period of observation.

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## THE TONSILS AS FOCI OF INFECTION*

W. F. Cunningham, M.D.
SEATTLE, WASH.

It is a far cry and may seem far fetched to mention evolution in a paper on focal infection, and hence this opening disgression will be made brief. Life, as this word is generally understood, began as a single cell. It was endowed with the fundamental attributes of all animal life. It moved, selected, enveloped and digested nutriment, and reproduced by division. By adaptation and transmission of acquired characteristics this simple form, through long eons of time, filled this earth with life forms of ever increasing complexity, until man himself appeared.

In this final product of these mysterious natural forces the single cell is multiplied into countless millions. But to the vast majority have been delegated particular attributes of the primal cell, some for locomotion, some reproduction, some sensory and so forth. They are the fixed cells of the body. In taking over these specialized functions they have lost the aggressive combative trait of the primal cell. But while this specialization of cell function has continued with ever increasing complexity throughout the evolution of life forms, there is inherent to the individual body an all-important minority of cells not only essential for the body economy but retaining the defensive and combative functions of nature's primal life cell. They are the moving army of leucocytes and their near relations.

All the while that this teeming world of life we see about us was evolving, another world too small to see, coeval with our primal life forms, carried on its life function. It is ever present. We have learned a little of this microcosm, but the unknown beyond the power of our microscopes and laboratories may be comparable to the infinity beyond the telescope. These organisms, too, retain tenacity for life, and many species the aggressiveness of the primal animal cell. A large class, vegetable, nonmotile, the saphrophytes, serve a necessary function to break down dead organic matter, especially in vegetable economy. Others can pass readily from a saphrophytic function to a pathologic one, or are frankly enemies from the start to animal cell life. It is this potentially harmful class, with which this paper is immediately concerned.

Microorganisms with this inherent tendency for disease making are ever present in the skin and intestinal tract, and that particularly virulent kind, the streptococcus hemolyticus, seems to choose the tonsil as its natural habitat. Just as this organism will live peaceably as a saphrophyte for an indefinite time and then suddenly show its virulent traits, we explain it as the result of lowered resistance of the host. That the tonsil should so frequently be the site for this phenomenon directs consideration to a few words on the anatomy of this organ.

Its development begins early in intrauterine life in a pocket known as the sinus tonsillaris. It might be helpful, for a better understanding of its structure, to keep in mind that it lies entirely within the mucous membrane like any simple follicle, the tunica propria forming the capsule and sending up trabeculae as supporting structures, and the stratified epithelium dipping down in pockets to the bottom. As the organ enlarges, two sheath-like membranes form, the plica triangularis, covering more or less of the anterior and lower surface and the plica supratonsillars covering the upper pole. These features, together with adhesions of the pillars, inhibit drainage especially from the crypts which open upwards. Throughout the reticulum of the tonsil are scattered lymphocytes, and about the crypts are found clusters of lymphocytes called nodes, clearer in the center where the germinal cells occur and denser about the margins, especially that part of the nodes that impinge against the crypts.

This organ is very active during child life. The lymph cells pass continually through the epithelial lining into the crypts and so reach the mouth cavity. Perhaps because of this process, the epithelium is so thin in places that its continuity is not discernible. With this situation in their favor it is little wonder that the tonsil is so frequently a site for the virulent manifestations of these bacteria.

Will these organisms have easy going, when at the first time they succeed in passing the frail barrier that heretofore has confined them to their life as saphrophytes in the debris of the crypts, to a new experience amid the living cells of their host? They will not. Though primal, multiplying quickly, tenacious to life, poison producing, they must withstand an onslaught of a great moving army, each unit of which is also endowed with those primal gifts for combat.

What evidence have we of the battle? The patient tells you he feels ill, has a headache. Looking at the throat, the tonsil, the field of battle, has been doubled in size to make room for the defenders; the crypts are overflowing with the dead and the debris of the fight; the thermometer tells you of the heat of the struggle, and the laboratory man can tell you that the defence army has been doubled by a new force brought into being. Should the enemy succeed in penetrating the wall of defence thrown up, an immediate secondary infection may be manifested in the neck glands, the joints or the endocardium. If, as usually happens in a few days, the tonsils have receded, fever is gone, patient feels all right, he thinks, and we may think so too, that his tonsils are back to normal again.

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From one or more such violent inflammations, however, the tonsil never quite recovers again. Its anatomy and histologic structure foster such a sequence. The pillars and plicae are likely to adhere. The pillars at times cover like a hood the upper pole. The deep crypts are narrowed or entirely obliterated by scar tissue in places. All this favors an excessive accumulation of detritus in the crypts, harboring colonies of bacteria under tension. Frequently small abscesses are found in the parenchyma of the tonsil, especially deep down just under the capsule. A low grade inflammation of the parenchyma may obtain. There is more or less fibrosis of the capsule. This pathology frequently is manifested by definite objective or subjective symptoms. The pillars may be red and adherent, seropurulent exudate may be expressed or adhesions of the organ to its bed may be demonstrated, or the patient may tell of a sore throat at varying intervals.

The foregoing survey of the field of battle and a consideration of the pathology present will show that at best it was a peace without victory. It was more often an armed truce with frequent desultory fighting and may be a major encounter at indefinite intervals, but there is always the possibility and even likelihood of insidious inroads by the enemy. Instances of immediate and open attacks beyond the tonsil have already been mentioned. The chronic symptoms are more subtle, more protean in their manifestations, are harder to detect. Lesions of the joints, the endocardium, the kidney or the nerves may be mentioned as the outstanding ones. And here one should not overlook mentioning those frequent occurrences of general ill health as shown by lassitude, anemia and so forth. Whether due to a low virulent bacterium in the blood stream or an endotoxin emanating from the primary focus is but a moot. At any rate we know from long experience that, if our diagnosis is right, the removal of the primary focus promises happy results.

After all is said, however, to operate or not to operate, that is the question. Despite all the well found evidence both clinical and pathologic against the tonsil, judicial fairness calls for our defence of this organ not only because of its purpose in the body economy, but to induce thought and caution in the many cases where doubt enters as to the proven culprit. There are two usual ways in forming a judgment, the history of the case and the appearance of the throat. When both of these are definitely against the tonsil, a decision for removal is confidently arrived at. When both are negative, tonsillectomy often brings discredit on a worthy operation. Between these extremes the subjective symptoms and the objective signs so frequently manifest a varied inverse ratio to each other that a decision is not to be arrived at lightly.

Take two examples, one a positive objective sign but negative history, the other a negative sign but a positive history. A young child is brought to you. It has large tonsils, that is, they seem large because they are of the pedunculated type, which by the way are often not as large as the submerged kind. If you enucleate these tonsils just because of the hypertrophy, and the adenoids of course too (which every one knows is the more important in respiratory defects and ear troubles), you may find in a short while a compensatory hypertrophy of follicular tissue on pharyngeal wall, and even into the bed of the tonsil. There may be an increased tendency to head colds and a chronic cough. This unpleasant sequela seems to obtain more often in the frail, fair skinned blonds.

Or the second example. An adult consults you. His general health is below par, he looks anemic, tires out easily and so forth. You examine his tonsils. There is little or no redness of the pillars. He does not remember of any tonsil trouble. Pressure with suitable instrument brings little or no exudate from the crypts. Sinuses and teeth are negative. An internist finds no foci elsewhere or other demonstrable cause. You feel justified, then, in enucleating these tonsils, and perhaps to your surprise, as the snare tightens, large masses of debris appear at the mouths of the crypts, and maybe an occasional abscess can be found just inside the capsule. There is a big probability that you have done something very much worth while for your patient.

Further examples need not be cited to show the uncertainties in making a decision as to operative procedure. In most cases hard thinking is called for and, if the responsibility is up to the specialist, not infrequently collaboration should be sought with some one who is able to exclude other foci far removed from the tonsil. Only by such care will needless operations be avoided and, per contra, by diagnosis and removal of these primary foci of virulent bacteria, that left unmolested can do so much to hurt and shorten life, will a real service be rendered the patient.

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## THE IMPORT OF ETHMOIDITIS *

Frank A. Plum, M.D.
HONOLULU, HAWAII

That foci of infections may and often do settle adjacent to bad teeth and within tonsils is a truth long since recognized. More recently the sinuses have come to be of a still greater interest in this particular because their anatomic construction is of such a character as to give to any infection a more dangerous sequence.

In this paper, while limiting our remarks to the ethmoid, it must be remembered that they apply in part to all of the sinuses. The primary cause of sinusitis is the same in every case; it is based primarily upon obstruction to drainage. To this may be added various factors, the pollution of the atmosphere of our large cities by dust and smoke, the underexposure of the individual to the ultraviolet ray of sunlight, the deficiency of vitamin A in the diet, excessive swimming, particularly under water, the existence of a so-called allergic state, in which the mucous membrane has a lowered threshold of irritability.

In order to best appreciate the importance of the ethmoid, we should think of it not as a few cells but as the ethmoid mass as it is. Mosher speaks of it as two pyramidal shaped bodies, joined together at the top by a layer of thin bone, this bone having a projection upward and another downward. Placed in the nose, the base of the pyramid is posterior, the apex anterior. The thin bone connecting the lateral masses is the cribriform plate. The lateral masses begin to develop about the fourth to fifth month of fetal life. The ethmoid cells proper are not developed until early in the fifth year.

The total ethmoidal labyrinth occupies a keystone position in the make-up of the skull. Above it lies the brain, to the outer and under side are the orbit and antrum, posteriorly the sphenoid and internally the nasal cavities appear. Thus, were it possible to remove the ethmoidal labyrinth in one piece, the intracranial cavity, orbit, antrum, nose and nasopharynx, would join in forming one large space. Then, when we remember that its limiting wall is very thin, that the cells are not always where they should be but may project back of the sphenoid, above or below the orbit or into the frontal sinus, and that there are occasionally deficiencies in the bone, one readily may understand the possibilities for damage from infection.

### DIAGNOSIS

We are anxious to make our diagnosis early, and frequently that is a difficult problem. The acute case may be more easily recognized by the location of macroscopic pus but this type is not so important as regards general toxic absorption, for the body is already reacting, and is holding its own for the time at least.

We must depend on an accurate history, particularly of previous colds. In a general way we may state that every cold results in a certain amount of ethmoiditis, that recurring colds cause a recurring and then frequently a chronic inflammation. If the drainage is fair, the condition may manifest itself chiefly by the discharge and by a stuffy nose; if the drainage is poor, there will be both toxic absorption and results of pressure due to the infection being confined in a closed space, and the larger the cell and thinner the wall, the more pronounced will be the symptoms.

Three important diagnostic points may be elicited from the history.

1. If the patient states that he is constantly catching cold and is very susceptible to draughts, a sinusitis is probable.

2. If he states that he has not been well since having an attack of influenza, the sinuses are usually involved.

3. Remember that all sinus diseases are made worse by alcohol because of the intracranial congestion that it always produces.

The patient may come to you because of headache. In many cases he does not complain of this but of eye trouble only. Either he reports pain after using eyes or he may have a sudden or an intermittent loss of vision.

In case he complains of headache, it may be frontal, temporal or occipital, or all three combined. He frequently complains of a pain behind the eyes; or of frequent watery colds and sneezing. He often complains of a nasty taste in the morning; asthmatic attacks are common. Anosmia or loss of sense of smell is very frequent.

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A careful history having been taken, an examination of the visual acuity, eyegrounds and the visual fields should follow. A glance at the posterior pharynx may disclose a stream of mucopus flowing down the pharyngeal wall. In the nasal examination we pay particular attention to the condition of the middle turbinate.

For practical purposes, ethmoiditis may be divided into three main types: (1) the hyperplastic, with or without polyp formation, (2) the suppurative, (3) a mixture of these two.

Ethmoiditis is no respecter of age. It may be found in children and failure to recognize it may lead to a chronic state that becomes a great handicap to the growing child and blights his entire adult life.

McCullagh reports a series of cases in children. In his series the antrum was most frequently involved but the ethmoid infection produced the most serious complications, particularly eye symptoms such as orbital abscess, orbital edema, neuroretinitis, retrobulbar neuritis, papillary edema.

In children the condition usually responds to conservative treatment. In adults the complications are similar to those found in children, only cardiorenal and meningeal symptoms are more frequently seen.

Hyperplastic ethmoiditis with polyp formations is frequently associated with asthma. The coincidence of this is due to the fact that the bronchi and nasal mucosa are dependent upon a common vasomotor stimulation.

Meningeal symptoms, particularly a leptomeningitis, are occasionally reported. Turner has recently reported a proven case of an acute purulent leptomeningitis, in which the infection spread to the meninges along the perineural lymph sheaths of the olfactory tract. The complication arose spontaneously from a primary focus in the nasal cavity without involving the interlying bone.

Puckworth has reported a case of a man, age 63, who was confined to an asylum for twenty years. At autopsy he was found to have been suffering from marked sphenoiditis and ethmoiditis so extensive that the entire right temporal bone, sphenoid and ethmoid labyrinth were caseous and the sphenoid filled with cheesy green pus. There are a number of authentic cases on record of individuals who have been confined to psychopathic institutions for a period of years who have entirely recovered the normal mentality after sinus operation.

Some cases of carcinoma of the larynx in very young people have been reported. MacKenty reports a young woman, aged 20. It was interesting to note that she had a pansinusitis since childhood. A severe laryngitis existed for four years before it was possible to make a diagnosis of carcinoma of the larynx.

We are all seeing people past middle life who for no apparent reason suddenly develop signs of serious disease. One has a cataract, another nephritis, another myocardial disease. Why do these degenerative changes occur? There is a cause but the examining physician usually satisfies himself with finding the result only. What has occurred in many cases is that this degenerative change has been produced by the action of an infinitesimal amount of toxin over a period of years. The flow has been too slight for him to notice; better for the patient had it been severe and sudden.

In line with the idea of preventive medicine, these small toxic traumatisms must be stopped, their accumulative effect prevented before degenerative changes take place in the man's essential mechanism. Due to the fact that the sinuses are so hidden away, they may continue to manufacture absorbable toxins and escape suspicion. The tonsils and teeth being readily examined are held accountable for acts possibly not committed, speaking generally regarding systemic conditions. I feel that the sinuses play a much more deadly role as causative factors for degenerative disease in the latter decades of life than the tonsils or teeth.

# CHRONIC ANTRUM DISEASE*

L. E. Patrick, M. D.
SEATTLE, WASH.

We must bear in mind that we may have a coexisting infection in other sinuses as well as the antrum which may complicate the symptomatology and diagnosis. It is my purpose to discuss only chronic antrum disease, however, in this paper which I believe will be a sufficiently broad subject.

I will not deal at length with a train of symptoms we all know quite well, but must mention their marked variation, and the fact that many times we have few or no local symptoms. Least often, if ever in chronic antrum disease, do we have pain or tenderness over the affected antrum. Many of these cases complain only of a series of frequent head colds with profuse discharge during the exacerbations only, and are relatively free from local symptoms the remaining time. It is the chronic cases that are associated with a general systemic complication, such as myositis, arthritis, asthma, endocarditis, bronchitis and numerous others, of which I feel we should spare no end of study.

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### PATHOLOGY

In pathology we have quite a variation, but on the whole there is some form or result of chronic inflammation. Many cases undergo a gradual thickening of the mucous membrane lining the antrum with or without polyp formation. Some may undergo a gradual thickening with later atrophy, and become thinner than normal. These latter membranes appear paler than normal when viewed through a Caldwell-Luc operation window and to the inexperienced observer may closely resemble normal mucosa. But we find that these membranes strip very readily from the underlying bone, and there may be areas where they are entirely separated. Sometimes we find small subperiosteal abscesses. There may be cystic formation, single or multiple, containing mucus or serum. An actual osteitis may be present in the bony wall.

On microscopic section all these types show chronic inflammation. The membrane, if thickened, is edematous with much round cell infiltration. A bacterial study of these membranes removed at operation has been worked out quite carefully by Kistner,[1] as well as a considerable amount of other valuable data.

The streptococcus seems the prevailing organism in the more chronic and severe cases and the staphylococcus next in frequency. As we all know, the streptococcus is not primarily a pus-producing organism. This would bear out quite well the absence of pus in our most severe types of chronic antrum diseases and the presence of edema in the tissues. The prevalence of pus during acute exacerbation is accounted for by the staphylococci which are secondary invaders and more or less transitory.

### DIAGNOSIS

I consider the antrum puncture with a trocar and washing the least reliable procedure we have in making a diagnosis of chronic infection, unless we make a microscopic examination of the fluid. The antrum puncture and washing is quite valuable in diagnosing and treating acute antrum infections, although a negative washing will often mislead us when we have a thick gelatinous mass of pus. The roentgen ray is our most important single factor in determining the pathology present but taken alone will often mislead in either direction.

In a chronically infected antrum, it is pus least of all that we are looking for, although it may be present in various forms during the acute exacerbations. We wish to know first of all if there is a thickened, diseased or polypoid membrane, and if so, whether this membrane is diseased beyond all repair or not. Within the nasal cavity we may find signs of chronic or acute inflammation. There may be pus coming from beneath the middle turbinate on the affected side or may be none.

Of considerable merit in diagnosis is the cytologic examination described by Sewall.[2] His technic is to introduce into the antrum through the ordinary antrum puncture needle five to ten c.c. of sterile water and reaspirate as much as possible for examination. The aspirated fluid many times will be relatively clear or show only a slightly milky tinge. This fluid is then centrifuged and the sediment examined under the microscope. This may show cellular debris, consisting of polymorphonuclear leucocytes, lymphocytes, plasma cells and epithelial cells in various stages of disintegration.

The significance of these findings is, first, the fact that normal antra show no cellular content whatever and, second, low grade infection is productive of mononuclear leucocytes, while the more active processes furnish either polymorphonuclear or polys mixed with mononuclear cells. I feel that this method is very valuable in aiding our diagnosis, where we have very slight evidence in our roentgen plate.

Using lipiodal as a contrast medium to demonstrate thickened mucous membrane has not been successful in my hands. I have found several markedly thickened membranes at operation which did not appear so with the lipiodal picture and only faintly suggestive in the ordinary roentgenogram.

### TREATMENT

If we feel reasonably sure that a chronic infection exists, the least we can do first is to make an intranasal window beneath the inferior turbinate, irrigating the antrum once or several times. Whether we get pus or not has no significance. Such aerations and irrigations, however frequent, will not cure a very badly diseased antrum of the type I have described in the preceding pathology. After having made a large intranasal window in the inferior meatus, I generally introduce a nasopharyngoscope into this opening and observe the lining membrane of the antrum. We cannot see all of the antral mucosa but enough of it can be viewed to add materially to our decision whether to do a Caldwell-Luc operation or not.

Many patients, who have had symptoms for several months or even longer and are really chronic or subacute cases, can be cured by an intranasal window. However, the number of cases who have permanent destruction beyond repair is surprisingly large. It is on these cases that I prefer to do the most common radical antrum operation, which is the Caldwell-Luc, under local anesthetic.

I believe in removing the entire lining membrane from the antrum as nearly as possible in one piece. The counter opening into the nose is made quite large and well down to the floor and anterior angle, extending about two-thirds the way to the posterior wall of the antrum. In my experience the less aftertreatment they are given the better, with the exception of one washing about a week after operation and occasional mild probing of the nasoantral window. I do not believe that a mucous membrane flap from the nasoantral wall laid into the antrum floor is a very successful aid in forming a new membrane.

If we are not sure of the extent of the pathology in an antrum, we do no harm by making a nasoantral window resection first. After a few irrigations we notice many times this window fills in with granulation tissue and have to repeat the process within a few weeks or months. Many times the window will remain open and there will be very little discharge but the associated systemic disturbance, such as neuralgia, pains about the head, neck and shoulders, still persists. It is in many of such cases as these that a final Caldwell-Luc gives most gratifying results.

Many ask how and when the mucous membrane lining of the antrum regenerates after the Caldwell-Luc. Recently this has been worked out very carefully on dogs by Knowlton and McGregor.[3] Their conclusions were as follows: (1) One month after the antral lining is removed, epithelial regeneration is well established, and bone formation begins. (2) Three months afterward epithelial regeneration is complete and the canine fossa opening is nearly filled in with bone. (3) Five months afterward gland regeneration is well established and the mucoperiosteum as a whole looks almost normal. The newly formed mucous membrane is of columnar ciliated type of epithelium, contains glands and resembles the normal mucosa of the antrum in every respect.

We have often heard it said that we can secure healing and return to normal of all chronically diseased antra by simple ventilation through a large intranasal window resection. If this is true, why do we see so many noses with huge masses of polypi filling almost the entire nasal cavity, all of which are quite out in the open and well aerated?

Many are reluctant to do a radical antral procedure because of the sometimes rather severe local reaction. It is true that we often have considerable swelling of the cheek, sometimes subcutaneous hemorrhage with marked discoloration externally, and oftentimes quite a dissatisfied group of relatives upon first viewing the patient on the second or third day after operation. But what is this compared to the more or less constant severe agony these patients go through before operation, many times for months and years.

## CONCLUSIONS

The less surgery we can do to obtain results the better. Thus we start out with the simpler procedures first and, if we do not obtain results, we pass on to the more radical. I believe that many of the poor results claimed by some in radical antral surgery are due to the coexistence of infection in the other sinuses which has not been taken care of.

I have been doing the Caldwell-Luc operation on antra as a last resort for nine years and the follow-up results have been quite encouraging.

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Physiologic Effects of Nonliving Testis Grafts. Carl R. Moore, Chicago (*Journal A. M. A.*, June 14, 1930), reports on three experiments and concludes that the spermatozoon motility test provides a means of revealing the presence of testis hormone in guinea pigs for periods as short as ten days; yet by means of this test it has been impossible to detect any hormone liberated from two autoplastic, whole testis grafts placed in subcutaneous pockets. In the rat a cytologic study of the prostate gland and seminal vesicles affords dependable methods of detecting the absence of hormone for periods of from three to five days. Here, also, two autoplastic, whole testis grafts in subcutaneous pockets fail to delay the onset of castration changes for as short a period as two days. The autolysis of nonviable testicular grafts does not liberate hormone in amounts that can be detected by any means at present known. Furthermore, the testis hormone is not stored within the body but is excreted by the kidneys. A continuous supply is necessary to maintain the secondary sex characters in a normal condition. There is no known acceptable evidence that nonviable testis grafts, i.e., grafts that fail to become incorporated within the body and actively secrete, exert any immediate or remote beneficial effect on the host organism.

# POSTOPERATIVE SUGGESTIONS

James F. Scott, M.D.
YAKIMA, WASH.

Postoperative conditions may come up in the most simple cases that will, unless checked, lead to grave consequences. A recent check on the mortality statistics in the more common procedures, appendectomy, thyroidectomy, cholecystectomy and gastric ulcer operations, leads one to think modestly of our much vaunted surgical progress. A careful analysis of the deaths leads one to think that the old causes, infection and hemorrhage, are not now the determining factor in this lamentable increase.

We take it for granted that every surgeon fully appreciates the gravity of assuming the initiative and is ever ready to give to the limit of his time and ability to each case undergoing surgical treatment. The past two decades have, through the experimental laboratories, developed a mass of information that is of extreme importance to every patient. Unfortunately, the profession appears to think that involved and frequent blood chemistry tests are essential to in any way profit by this knowledge. Nothing could be farther from the truth.

The fact was empirically observed for some time and a few years ago corroborated by physiologic research, that a dog may live for weeks with a complete ligation of the bowel, provided he be supplied with abundant liquids, with sugar for nourishment, chlorides kept up, and lastly and most important the proximal bowel and stomach be prevented from dilatation.

If to these be added morphine and digitalis, we have almost the complete simple armamentarium required for postoperative malaise that is the first step in shock, ileus, bronchial irritation and anuria which a little later heroic efforts with oxygen, transfusion, etc. are powerless to control.

It follows without argument that every case should be considered thoroughly beforehand. Again, in a purely empirical way we have found out that the old depleting cathartic was not only needless but harmful, that a building up of the cell fluids was required. If an emergency and dehydration exist, 1 to 3000 c.c. of 5 per cent glucose with normal chloride solution should be given by hypodermoclysis before anesthesia. If the abdomen is distended, a duodenal tube should be introduced through the nostril and kept there until the abdomen is flat, with frequent washing out by means of hot water which the patient may drink at will, provided that the return flow be free. A sudden hemorrhage is practically the only condition in which transfusion is needed in emergency cases, which should be given subpectorally with good results and the least cardiac distress and it eliminates typing.

In the same way that knowledge of a reasonable innate stupidity is a valuable asset to any student, we may think that a surgeon, recognizing a certain clumsiness and laziness in himself, may do much to benefit his patient by devising methods that may be delegated to nurses and which otherwise may go by default. Any nurse can easily put fluid under the skin, but the intravenous method is forced to wait until someone has time and inclination to do it. One is not so sure that a sudden increase in the volume of circulating fluid is any help to a weakened heart muscle. In the tissues the fluid is gradually taken up and passed on to the cells with minimum work for the heart. The pain is negligible, as morphine is considered both a cardiac stimulant and a sedative to the nervous system when given in small repeated doses. The dehydrated thyroid case, though rarely seen now, was by far the most spectacular demonstration of the benefit of water to a dehydrated organism, the patient going from violent mania to a quiet sleep in a few hours.

The gradual onset of toxemia is the usual start of an abdominal case going wrong and, whether this is an obstruction of the bowel, bile passages or urinary tract, the decrease of blood chlorides and the increase of blood urea are the same and should always be thought of and examined for. Since treatment of the condition is much simpler than the laboratory test and is entirely harmless if the urea is not increased, this leads away from delay and ultra scientific methods. If we use the duodenal tube over a period of days, we have practically the same condition as a duodenal fistula with the draining away of the stomach acid and pancreatic juice, which we know is very rapidly productive of an upset in blood balance. That the tube will drain away toxic matter from the lumen of the stomach and bowel is entirely secondary in importance to the fact that it constantly draws off gas.

We look on the stomach and bowel as being continuous and equally involved in minor distention. This is the beginning of most cases of postoperative ileus, and a tube introduced early will prevent dilatation of the stomach and give more opportunity for retrograde peristalsis to empty the bowel, thus preventing obstruction. So marked is this result that an enterostomy is now a rarity in postoperative work. We think the tube an advantage in one respect. The patient may drink all the water he wishes and, while apparently this all drains back, we notice that in twenty-four hours he is less thirsty and in a day longer he has usually caught up with his water, while an enterostomy opening drains water from the system and may close slowly and leave adhesions.

There is apparently no advantage in a multiplicity of cardiac stimulants. Digitalin in large amounts tends to keep up the cardiac vascular tone. Shock is largely observed as the results of muscular weakness. The involuntary muscle of the heart, vessels, gastrointestinal tract and the conscious weakness of the skeletal muscles are equally involved. The lowering of blood pressure by dilatation of the capillary system goes along with the relaxation of the bowel wall with an ever increasing tendency to accumulate gas and interfere with the circulation in the thinning bowel wall.

An operative case that is not doing well, either before or after section, is put on morphine sulphate, grains 1/12, digitalin, grains 1/100, every hour, if required to keep him comfortable. The duodenal tube is introduced and kept free of mucus and large quantities of water given for as long as necessary. The head of the bed is raised one foot and glucose 5 per cent and saline 1 per cent solution introduced under the skin. About 1000 c.c. every eight hours for days is required. Stronger glucose solutions, up to 50 per cent, apparently have a stimulating effect, but may locally injure the tissues. These simple measures can all be carried out by a nurse, and to that extent prompt and continuous treatment are much more assured than more complicated measures which must await the time of the surgeon personally.

The simple basal anesthetic, morphine and atropine to control bronchial mucus, is considered as good as the newer more powerful drugs given intravenously. Blocking of the regional nerves is carried out while light gas oxygen anesthesia is being induced. The time on the table is considered of major importance; thorough work is not necessarily assured by the length of time consumed.

A postmortem, if possible, should be secured in any surgical case that goes wrong. Over a period of years information thus secured is invaluable. We are using the duodenal tube as a routine in postabdominal cases to prevent vomiting and dilatation. We have discarded the Murphy drip, as it may cause nausea, and use instead 1000 c.c. by hypodermoclysis in each case.

It is probable that a masterly simplicity of procedure, a firm hold on known methods, a constant vigilance that anticipates trouble before it is forced on one may help to bring our mortality rate back to what European countries are now achieving.

## CASE REPORTS

H. M., girl age 10 years, thin, anemic, anxious expression, had been ill three days. Abdomen greatly distended, pulse 136, temperature 104,° greenish vomitus.

An immediate gridiron appendectomy was done. Much free pus all over the abdomen. No stitches were introduced; three strips of rubber dam to pelvis and right kidney region and a hot moist dressing. This was done with regional block and very light gas oxygen.

As soon as she was awake a small duodenal tube was introduced and kept in for four days. Morphine was given and glucose, 300 c.c. of 5 per cent in normal saline. A stormy two weeks followed. Then a pus cavity opened to the left of the sigmoid. Three weeks later she went home and had an acute distention shortly. The nasal duodenal tube was introduced and retained two days. Symptoms have not since returned.

O. J., man of 44 years, came to the hospital in the fourth day of an acute abdomen, with vomiting, greatly distended, leaky skin, pulse 130, temperature 102.6.° A nasal tube was introduced and syphonage started while he was being prepared.

A gridiron appendectomy was done. Incision was left open and two strips of rubber dam introduced. General peritonitis. The tube was left in the duodenum for four days. He was flat and comfortable after the first thirty-six hours. Glucose and saline were given freely by hypodermoclysis. He went home on the eighteenth day.

Woman, Mrs. D., age 34, complained of gas and nausea for years.

Cholecystectomy was done, revealing chronic inflamed gallbladder with many adhesions. The duodenum seemed large, but no definite obstruction made out. The third day, marked nausea and distress and weakness, pulse 136, no distention. A duodenal tube was introduced with relief very shortly after, which was retained three days. Following this the patient improved and left the hospital on the nineteenth day. It seemed probable that future partial duodenal obstruction might be noted.

These three cases would have been desperately ill without the use of the tube and it may have been life saving in all.

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Paroxysmal Tachycardia in Pregnancy. Jacob Meyer, Julius E. Lackner and Sydney S. Schochet, Chicago (*Journal A. M. A.*, June 14, 1930), report two cases. They insist that the recognition of paroxysmal tachycardia in pregnancy should put the obstetrician on his guard as to its possible recurrence during labor. The decision as to the time and method of terminating pregnancy is to be determined in each case by evaluating as far as possible the condition of the myocardium and the duration and severity of previous attacks. Paroxysmal tachycardia is to be differentiated from complications in labor, such as internal hemorrhage; premature separation of the placenta, concealed hemorrhage, shock or massive collapse of lung.

# PERINEAL ANESTHESIA IN OBSTETRICS*

Torleif Torland, M.D., F.A.C.S.
SEATTLE, WASH.

In our endeavor to relieve pain in labor and make the ordeal of childbirth safer and more endurable for the mother, the whole armamentarium of both general and local anesthesia has been utilized. However, in spite of extensive use of local and regional anesthesia for many years in general surgery, it is surprising how little this form of analgesia has been applied in the realm of obstetrics. The pioneers of local anesthesia in Europe, as Braun, Schleich, Sellheim and Reclus, advocated it many years ago, also for gynecologic and obstetric use, but in this country it found only a few advocates. Notably among these can be mentioned Rucker, Hertzler, Gellhorn, King, Meeker and Frazer.

Perineal anesthesia by local infiltration was first proposed by Braun and popularized in this country by Gellhorn since 1913. This investigator had first tried the pudic nerve block as originally introduced by Sellheim but later on gave it up for local infiltration. Gellhorn's work did not gain much attention. "Only a flicker of interest was evidenced here and there," as he expresses it himself in his latest contribution in 1927.

The incentive for my own interest in this field was derived principally from an article appearing in *Surgery, Gynecology and Obstetrics* in 1916 by King of Denver. He describes his technic of nerve block for analgesia and relaxation of perineum during labor. This article is made particularly interesting by his excellent anatomic investigations and his descriptions of the female perineal fascial planes and nerve supply. His work has not aroused the interest it deserves.

During the last eight or ten years I have used the perineal block as a routine in practically all primiparae and in many multiparae. I have injected in several hundred cases without complications or untoward results. In one single case I had a transient syncope with sudden paleness, cold perspiration, thready weak pulse, evidently caused by injecting the novocaine into the blood stream. In a few minutes the condition was normal, without any further treatment. But one must, of course, always guard against this eventuality by first ascertaining whether the needle is in a vein or not. This can easily be done.

King, in his series, had a few cases of small areas of necrosis in the labial mucosa. This condition is produced when too much adrenalin is used. One should, therefore, never use more than 1 drop of 1/1000 adrenalin to each 3 c.c. novocaine solution. This is quite sufficient, and has in my practice never produced any necrosis.

*Technic.* I have closely followed King's with a few modifications. For each case I always have a local anesthesia set sterilized and prepared on a special tray. This consists of a 5 c.c. Luer syringe with several needles, one very fine for the initial wheal and one or two larger for the deep injection. Besides this I have two ordinary medicine glasses, one for mixing and the other for saline, besides ampoules of 2 per cent novocaine solution with adrenalin.

It is essential here, as in all general surgery, where consciousness is retained, to precede the anesthesia with some form of twilight sleep, whether this be the original German first stage twilight sleep, or the Gwathmey rectal ether-oil instillation, with or without morphine and magnesium sulphate, or only a single injection of morphine or morphine and scopolamine. As practically all my patients, at least all the primiparae, have either the real twilight sleep or Gwathmey ether instillation for their first stage, they usually come to the second stage of expulsion, more particularly to the perineal stage, in such a condition of hazy memory and diminished sensation that any further injection of hypnotic before the perineal blocking as a rule is unnecessary.

Everyone doing these injections must know the anatomy of the perineum. I shall not tire you with a minute description which is unnecessary. It is sufficient for the purpose of this subject to remember the Colles' fascia which is considered the most sensitive part of the perineum, and which in reality only is the lateral extension of the hymen, and, therefore, lies on the same depth level as this structure. Under this fascia on both sides of the vagina, extending from the rectum and almost up to the symphysis pubis, is a long narrow space called the ischiorectal fossa. This space is filled with loose areolar and fatty tissue and contains the principal nerves and blood vessels supplying the perineum and vulva. This fossa can be divided in two triangles, the anterior and the posterior, by a line drawn from one tuberosity of the ischium to the other. This line will go approximately through the perineum midway between the anus and posterior vaginal commissure. In the anterior triangle thus formed will be found the pudic nerve and branches of the perineal and genitocrural. In the posterior space is located the principal branch of the perineal and branches of the hemorrhoidal and sacral nerves. It is easily understood, therefore, that by one injection each in those two triangles (bilateral, of course) the whole nerve supply of the perineum and vulva can be blocked and completely anesthetized.

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* Read before King County Medical Society, Seattle, Wash., March 24, 1930.

The injection is very simple. One-half and 1 per cent novocaine solution is used. The pubic arch must be palpated to be sure of land marks. In the anterior triangle the needle is inserted 2-4 cm. above the lower margin of the vagina and 2 cm. from the rami. The needle is passed 2-4 cm. deep until the resistance of Colles' fascia is felt. This is pierced and 3-5 c.c. of a 1 per cent novocaine solution injected. King advocates a 2 per cent solution, but I have personally found 1 per cent to be quite satisfactory.

In the posterior triangle the needle is inclined laterally and entered at a point midway between the anus and the tuberosities to a depth of 4-5 cm., and 5-10 c.c. of a one-half per cent solution is injected on each side.

*Discussion.* Most frequently injection in the anterior triangle alone will be found sufficient to produce the necessary analgesia and relaxation. Only when there is an exceptionally tight narrow vaginal outlet, where one might expect multiple, deep lacerations of second or even third degree, is it of advantage also to inject in the posterior triangle.

It is easy for anyone who is familiar with the mechanism of labor to distinguish between two distinct types of pains. First are the pains of dilatation produced by pressure on the sacral nerves, but as the head descends there will be tearing and stretching on the pelvic floor and the perineal muscles. There can be no question but these last pains are more severe and agonizing than those of dilatation. The first stage pain can at any rate be made quite endurable, and in most cases can be almost eliminated from memory by twilight sleep, Gwathmey or light ether anesthesia, while the latter type, the expulsion pains, ordinarily needs a deep ether unconsciousness.

For those of us who did obstetrics in the days when severe pain was supposed to be an unavoidable part of childbirth, an almost religious necessity, and when, therefore, anesthetics of any kind seldom were used, it was easy to distinguish between the ordinary light pain or dilatation and the real bearing down pains, where the head was forcing its way through the pelvic floor, tearing and stretching the perineal muscles and fascia. At this stage, when the suffering is at its highest and the patient begs and prays for relief, it is then that we can apply this local perineal anesthesia to the best advantage.

The effect is most striking. A few moments after the injection has been given the patient undergoes a complete change. The groaning and moaning is still present but the piercing, agonizing shrieks of the bearing down pains disappear as by magic. The perineal muscles relax, the vaginal outlet gaps widely, and the presenting part passes out through the paralyzed opening, very frequently without any lacerations whatever. Furthermore, the ether or gas anesthesia which practically always otherwise is necessary, can usually be reduced to a minimum, frequently be omitted. If episiotomy is found necessary or lacerations occur, they can easily and immediately be repaired absolutely painlessly and with a minimum loss of blood, due to the effect of adrenalin.

I have always been in the habit of doing immediate repair of lacerations, while I was waiting for the proper time for expulsion or expression of the placenta. The argument used against this has mostly been that the increased amount of anesthetic needed for this, and given before the uterus could contract properly, predisposes to postpartum hemorrhage. My experience disproves this theory. But for those who believe otherwise, the use of a local anesthetic during this repair and consequently the elimination of additional anesthetic should certainly be most satisfactory, and will enable one to do immediate repair without trembling and fear of postpartum hemorrhage.

When to this can be added the absolute assurance that this perineal anesthesia has no remote results, has no influence on the uterine contractions, that there are no higher incidence of necrosis or infection, no difference in wound healing, and that it can without much experience be used by anyone in the home as in the hospital, it seems to me that we have here a method of considerable importance, worth further investigation and more extended use.

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In a day of moderate activity a man's heart does enough work to lift a man 1,000 feet. Even in a day spent lying in bed the heart does enough work to lift a man weighing 150 pounds up a hill 500 feet high. Thus it adjusts its effort to the needs of the body. During an athletic contest it meets the demand of the muscle for blood by working three and a half times as hard for short periods. Dr. B. C. H. Harvey tells these interesting facts in his lessons in human anatomy now appearing in *Hygeia,* the health magazine of the American Medical Association.

# ASYMPTOMATIC SYPHILIS

## A STUDY OF ONE HUNDRED TREATED CASES *

S. E. Light, M.D.
SAN FRANCISCO, CALIF.

Modern syphilologists agree that most cases of asymptomatic (concealed, latent) syphilis should be treated, but the modern literature is surprisingly meager in suggestions and experiences regarding the extent and results of this treatment. It was thought that a brief report on a group of such cases would be of interest.

One hundred cases under treatment and observation at Stanford were selected for study. These were taken consecutively and without prejudice as to outcome. Each had been under treatment eighteen months or more. Physical examinations prior to the institution of treatment had revealed no luetic lesions and they were in apparently good health. Diagnosis in each case was made on the Wassermann reaction and history.

Treatment in each case was individualized, but, insofar as possible, it followed a general plan. The majority were put on potassium iodide with mercury inunctions for the first two to five weeks, and these were followed by courses of neoarsphenamine, alternating with courses of bismuth. Treatments were given at weekly intervals. A course of neoarsphenamine consisted of ten injections of from 0.45 grams to 0.9 grams each, and a course of bismuth comprised twelve injections of 0.2 grams each of the insoluble metal. A rest of one or two weeks was allowed between courses, and the Wassermann and urine were checked at frequent intervals. In a number of cases a course of mercury was occasionally substituted for one of bismuth. In fourteen resistant cases, after courses of bismuth, neoarsphenamine and mercury had failed, bismaren was tried with no better success. This was surprising in view of the very favorable results reported by some writers.

For the purpose of study, the cases were divided into four groups and a chart of averages prepared (see table 1). Group I consists of thirty-three cases which became permanently Wassermann-negative under treatment and have remained so to date. Of these, eighteen have also had the spinal fluid checked. These cases will be closely observed until in each case five years of frequent negative Wassermann reactions have elapsed. If physical examinations and spinal fluids also remain negative, they will be considered clinically cured, but will be instructed in the future to report at least once a year for check up. The average length of treatment in this group was twenty-four months. The average number of months of treatment, before permanently negative bloods were obtained, was twelve, and the total average period of observation to date has been thirty-five months.

Group II consists of thirty-seven cases with uncertain erratic Wassermann reactions, sometimes negative and again weakly positive. This type of patient is rather exasperating to the physician. Just when he and patient are encouraged by a series of negatives, there may be a positive with no apparent cause. One dislikes to discontinue active treatment when a permanent negative is apparently so near, yet in fairness to the patient it cannot be continued indefinitely. The average treatment to date in this group is twenty-seven months.

Group III represents the typical so-called "Wassermann-fast" case. The patient is in good health, but the blood remains strongly positive, and no amount of treatment seems to alter it.

Group IV consists of three cases, in whom treatment seemingly failed to control the disease. Two, after thirty-six and twenty-one months of treatment respectively, were found with positive spinal fluids. These spinal fluids, however, had not been checked previously. Another case, after a total observation of forty months, developed an aortitis, and died with an intercurrent nephritis.

*Age incidence.* The ages ranged from eighteen to sixty years. However, all but a few were in the thirties, the average being thirty-six. There was a definite age increase noted in group III over groups I and II.

*Early lesions.* A large percentage of the men in each group recalled definite primary and secondary lesions, whereas most of the women denied any knowledge of primaries and secondaries. In general, a little more than half (fifty-three per cent) of the patients denied any knowledge of infection.

*Duration of disease.* Of the forty-seven per cent that recalled the approximate date of infection, the average duration was eleven years. Average durations in groups I, II and III were nine, eleven and sixteen years respectively, suggesting an increase of resistance to treatment in those of longer duration.

*Previous treatment.* Approximately thirty-three per cent of the patients in groups I and II had had previous inadequate treatment elsewhere, but only

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* From the Dermatologic Clinic of Stanford University School of Medicine.

Table 1.

| | GROUP I | | | GROUP II | | | GROUP III | | | GROUP IV | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Totals or average | Male | Female | Totals or average | Male | Female | Totals or average | Male | Female | Totals or average | Grand total or average |
| Number of cases | 17 | 16 | 33 | 19 | 18 | 37 | 15 | 12 | 27 | 3 | 0 | 3 | 100 |
| Average age | 38 | 32 | 35 | 36 | 34 | 35 | 43 | 37 | 39 | 28 | 0 | 28 | 36 |
| Number who denied early lesions | 4 | 14 | 18 | 4 | 15 | 19 | 6 | 10 | 16 | 0 | 0 | 0 | 53 |
| Average duration in years (where known) | 8 | 11 | 9 | 11 | 11 | 11 | 18 | 6 | 16 | 10 | 0 | 10 | 11 |
| Number previously treated elsewhere | 5 | 6 | 11 | 8 | 4 | 12 | 2 | 0 | 2 | 3 | 0 | 3 | 28 |
| Average months of treatment here | 23 | 26 | 24 | 27 | 27 | 27 | 24 | 30 | 27 | 33 | 0 | 33 | 26 |
| Average months of treatment before blood remained negative | 11 | 12 | 12 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Number of pyogenic foci | 0 | 1 | 1 | 7 | 6 | 13 | 6 | 6 | 12 | 1 | 0 | 1 | 27 |

Asymptomatic syphilis, one hundred treated cases. Group I, Wassermann-negative cases; Group II, Wassermann-erratic cases; Group III, Wassermann-fast cases; Group IV, cases not controlled by treatment.

seven per cent of those in the Wassermann-fast group gave any history of previous treatment. This would bear out the theory that any treatment, however inadequate, is of value.

*Duration of treatment.* The minimum period of treatment was eighteen months and the maximum seventy-two, the average being twenty-six. An effort was made to continue intensive treatment for at least a year after the blood became permanently negative.

*Permanent negative Wassermanns.* Permanent negative Wassermanns were obtained in some cases at the end of the first three months of treatment, in two cases after twenty-two and thirty-six months respectively, but the average response was eleven.

*Pyogenic foci.* The relative freedom from chronic pyogenic foci (three per cent) in group I is quite striking, as compared to thirty-five per cent in group II, and forty-four in group III. Were it possible to eradicate these foci, thus greatly improving the patient's general resistance, it is assumed that response to treatment would be accelerated.

## SUMMARY

One hundred cases of asymptomatic syphilis, each with thirteen or more months of treatment, are reviewed. Thirty-three were permanently Wassermann-negative, thirty-seven were presenting erratic Wassermann reactions, twenty-seven were truly Wassermann-fast. Two had been found with positive spinal fluids, and one had developed an aortitis and died with intercurrent nephritis. Except for the last three all were in apparently good health.

The low percentage of previous treatment and the high percentage of pyogenic foci in the Wassermann-fast group were quite striking.

The effectiveness of treatment seemed to vary with age of patient, duration of disease, previous treatment and pyogenic foci.

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Psittacosis. L. W. Gorham, Albany, N. Y., and F. G. Calder and J. D. Vedder, Johnstown, N. Y. (*Journal A. M. A.*, June 7, 1930), describe five cases of acute infectious disease, all occurring within a relatively short period among the members of a single household into which there had recently been brought a sick parrot. There was nothing remarkable in the clinical aspect of this series of five cases. The symptoms and physical signs found were those usually encountered in grip, pneumonia or the enteric group of fevers. The white blood counts were uniformly low. Cough when present was unproductive. As a rule the temperature was high and the pulse relatively low. The bacteriologic study of the blood and stools was entirely negative. The one distinctive point in connection with this series of cases is that every one of the patients was proved to have had close and intimate contact with a sick parrot which arrived in this country from Colombia. House epidemics of an unusual form of pneumonia have been encountered in which there was no contact with sick parrots. One is not warranted, however, in hastily drawing the conclusion from this that all previous epidemics of psittacosis were simply examples of an unusual type of infectious disease, and that the fact that a sick parrot was in the household was merely a coincidence. Although a few rare instances have been reported in which the disease apparently passed from one individual to another, this type of transmission is decidedly unusual and is denied by numerous authors. Hence the danger of an epidemic of serious proportions does not exist and there are no grounds for undue public excitement or apprehension. The etiologic agent in human psittacosis has not yet been definitely established. There is no convincing proof that the bacillus described by Nocard is the cause. Recent studies in England strongly suggest the possibility that a filtrable virus is responsible for the infection both in parrots and in man, and this work has been confirmed recently in this country.

# IRREGULARITIES OF THE PULSE

R. T. Scott, B.S., M.D.
LEWISTON, IDA.

Every man engaged in the practice of medicine is daily palpating the radial pulse and auscultating the precordium of his patients. In doing so he frequently notes irregularities, and it is to the significance and interpretation of the more common of these that I wish to draw your attention. It is not the diagnosis of the cardiac irregularities by means of mechanical methods which I wish to discuss, but rather the diagnosis without these aids. The tremendous importance of mechanical methods as the polygraph and electrocardiogram in the diagnosis of these irregularities is appreciated by all, but the great majority of men in practice have neither the facilities nor training to be able to apply these methods in the solution of their problems. For the purpose of our discussion let us forget the mechanical methods, and see how we may diagnose these irregularities without them; and having made a diagnosis, give a rational prognosis, if possible.

Lewis[1] says that the alert practitioner will be able to diagnose the great majority of these disorders without any mechanical aids. Gilbert[2] for example, says that one should be able to diagnose auricular fibrillation with the fingers on the radial pulse. Christian,[3] in his recent Oxford Monograph on the diagnosis and treatment of diseases of the heart, says, in speaking of the polygraph and electrocardiograph, "these instruments often help but they are not indispensable, and without them the trained clinician can render to his patients satisfactory service both in diagnosis and treatment."

In order to approach the clinical side of this subject with understanding, one should have clearly in mind the mechanism controlling the heart beat in health, and with this as a basis the changes in the mechanism which give the various clinical findings may be more clearly understood. It seems to me that if, when one makes a diagnosis, say of auricular fibrillation, he has a clear mental picture of what is going on in that particular heart, he derives a great deal more pleasure from his work. Again, if he knows what is going on in that fibrillating heart, he is in a better position to understand how digitalis and quinidine will help it. So, I believe, it would be time well spent to take a few minutes and review the mechanism controlling the heart beat, taking up the abnormal mechanism in conjunction with the clinical recognition of the various disturbances.

Some of the irregularities are impossible of recognition by any other than mechanical means, but as I have said before, it is only the more common disturbances that I wish to discuss. I do not mean to imply that I have anything new or original to offer concerning these irregularities and their detection, but simply hope to correlate and organize into a more useful mass certain well known facts, and perhaps arouse more interest in these always interesting cases. Due to the greater dissemination of knowledge concerning heart disease in the past few years, more people are becoming conscious of their hearts, and often will note irregularities in their own heart beats. It devolves upon their physician, when he is consulted about some such noted irregularity, to be able to appraise it for its true value, because not all cardiac irregularities, as you well know, bear an equal prognostic importance. Let me emphasize that the mere irregularity itself should not form the entire basis of judgment, but certain facts in the patient's history and physical examination must be taken into account. Given a patient with an irregular pulse, it makes considerable difference to the examiner whether he be ten or fifty years of age, whether he has had syphilis, is recovering from an acute infection, has some swelling of the ankles, has hypertension, a murmur over the mitral area, a tender liver, hyperthyroidism, or is perhaps a heavy smoker, and other pertinent facts which will bear no small part in the appraisal of the significance of the irregularity.

In the normal heart the impulse originates in the sinoauricular node, a network of spindle-shaped fibers lying at the upper end of the sulcus terminalis, embedded in the muscle tissue of the right auricle at the base of the superior vena cava. From this, the pace maker, impulses arise and spread over the auricular muscle to the auricular ventricular node, and from here by means of the bundle of His to all parts of the ventricles. The pace maker is under the influence of the vagi, particularly the right, which exert a restraining influence on the node at all times. Removal of the vagus effect by section or atropine will result in a very rapid rate, while, conversely, stimulation of the vagus slows the rate.

The various irregularities of the heart beat may be considered as resulting from one of two major influences, something which affects the normal initiation of the impulse, or something affecting the conduction of an otherwise normal impulse. Clini-

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* Read before a meeting of Nez Perce County Medical Society, Lewiston, Ida., Dec. 19, 1929.

cally, we see irregularities resulting from varied causes, as syphilis, acute infections, fatigue, tobacco, indigestion, myocardial degeneration, coronary sclerosis, etc. The actual changes which take place in the heart muscle or conducting tissue to initiate the abnormal rhythm are not always definitely understood. Probably no one cause is the determining factor in all cases, but rather a combination of influences.

Carter et al[4] advance the theory, with experimental data for support, that all the abnormalities in rhythm may possibly be explained on the basis of local circulatory deficiency. These areas of deficient blood supply will suffer from an inadequate removal of the products of tissue metabolism or an insufficient supply of oxygen in that area. An accumulation of waste products, resulting in an increase in hydrogen ion concentration in the tissue locally, may produce a localized block. Or if the pH rises to a higher point in the tissues, we may have increased irritability with spontaneous excitation in the area. This is an interesting explanation, since they have shown by experiments on the isolated dog's heart, that they may vary the rate at will by simply changing the pH of the perfusing fluid. They were also able to very the rate of conduction by changing the pH of the perfusate. They emphasize that, whatever the fundamental process in the development of the cardiac rhythm may be, it takes place more rapidly the more alkaline the fluid bathing the tissue of the heart. Moreover, the excitation is retarded the more acid the fluid. The propagation of the excitatory impulse varies as the pH varies. They suggest that for the spontaneous development of excitation in the heart there must be maintained a certain difference in pH within and without the tissues.

Vaughn[5] tells how Lewis has studied the initiation and character of the early heart beat by removing the organ from two or three day old chick embryos, and studying them in Lock's solution. He showed that the rate varied definitely with changes in temperature, carbon dioxide tension, pH and salt content of the medium. He found also that he could produce complete heartblock by an abrupt rise in temperature of the Lock's solution and a return to normal rhythm on lowering the temperature. Since these hearts contain no auricular ventricular bundle, the block cannot be due to an injury here, as is commonly considered to be the case in heart block seen clinically.

Smith,[6] in studying the effects of ligation of the coronary vessels, found that various arrhythmias may be initiated by the production of a localized ischemia. Burnett and Pilz[7] studied a series of one hundred cases following the acute infections, mostly influenza and common colds, and noted many irregularities and disturbances of rhythm. They state that there is no apparent relationship between the severity of the initial infection and the disturbances which may follow. Hamburger[8] reports involvment of the auricle and conduction system in influenza, and shows that the effect may vary from extensive damage, resulting in early death to the transient changes noted during the course of the disease.

Hoskin[9] from a study of the hearts in convalescent diphtheria patients concluded that disturbances in rhythm are common, and are of enough import to warrant electrocardiographic studies before they are discharged. Jones and White[10] cite two cases of heart block developing during the course of diphtheria, one of them persisting for nineteen years. Thus we see that myocardial involvement during the course of the various acute infections may be first noted as some disurbance in rhythm. While many of the disturbances may only be detected by the electrocardiogram, still some of them will be noted by the usual clinical methods, if one has them in mind at the time. Straus and Hamburger[11] report three cases of gallgladder disease which showed permanent extrasystoles, and following cholecystectomy, the arrhythmia disappeared permanently in two and temporarily in one. They point out that extrasystoles associated with abdominal disease are due to a reflex disturbance through the vagus, associated probably with increased irritability of the myocardium from absorbed toxins.

The cardiac arrhythmias are commonly divided into the following types: (1) Sinus arrhythmia, (2) heart block, (3) extrasystoles, (4) paroxysmal tachycardia, (5) auricular flutter, (6) auricular fibrillation, (7) alternation of the pulse.

*Sinus arrhythmias.* These are irregularities produced by an interference with the conducting mechanism at the point of origin of the impulses, the sinoauricular node. These irregularities are commonly divided into two types, respiratory irregularities and those not associated with respiration. Those associated with respiration are by far the more common, and make up the greater proportion of this group. They are usually easily recognized. The great majority of irregularities seen before the age of ten or twelve are of this type. On examination they are seen to be a gradual rising and falling of the rate, synchronous with inspiration and expiration. The apex and radial pulse correspond. They are of little significance, since they are merely the exaggeration of a normal phenomenon. Grave mistakes may be made by the erroneous interpretation of such an arrhythmia in an otherwise normal child and thus condemning him perhaps to years of semiinvalidism. Especially is this easy to do if he is possessed of nervous and overanxious parents.

*Heart block.* This is an arrhythmia, in which the impulses traveling from sinoauricular node to ventricle are blocked, resulting in a delay or lack of response by the ventricle to the auricular impulses. The simplest block is merely a delay in ventricular response to auricular stimulation. A somewhat further degree of block is seen where the ventricle occasionally does not respond to stimulation, or rather we may say, received no stimulation, and we have a dropped beat. The frequency of these dropped beats will vary, depending upon the degree of block. The highest degree is complete block, a condition where no stimuli pass from auricle to ventricle. When this happens we see the ventricle initiating its own rhythm, so-called idioventricular rhythm, which is usually around thirty-five per minute.

Heart block is not one of the more common arrhythmias, it with auricular flutter, paroxysmal tachycardia and sinus arrhythmias making up only fifteen per cent of the cardiac irregularities according to Lewis.[1] Heart block of the chronic type in the great majority of cases is due either to rheumatic fever or syphilis. Mild temporary grades of heart block are seen in many of the fevers and are no occasion for immediate alarm. The actual block may result either from damage to the auricular ventricular bundle, which need not necessarily be widespread, or from a diffuse involvement of the cardiac muscle. Senile conditions account for some.

The symptoms associated with heart block may arise from the disturbance in rhythm, but most often are due to a widespread involvement of the cardiac muscle, due either in most cases to a preceding rheumatic fever or a luetic infection. In the former instance we may see precordial sensations of discomfort associated with the dropped beat, or in case of a complete block the individual may lose consciousness due to the extremely slow rate. In the second type symptoms are due to the inability of a failing myocardium to carry on successfully. Any case of heart block demands a searching investigation into the condition of the cardiac muscle. Its clinical recognition is relatively easy. On palpating the radial pulse there is observed to be a dropped beat every second, third or fourth pulsation as the case may be, or perhaps a beat is dropped at rather irregular intervals. If one listens over the precordium while palpating the radial pulse, it will be noticed that no impulse is heard here at the time the impulse is dropped at the wrist.

Heart block should always be differentiated from extrasystoles which may be done. It should be regarded as evidence of damage to the heart muscle and conducting mechanism. As a rule, these cases are serious and any judgment passed should be based on the integrity of the cardiac muscle. Clinically one must also differentiate complete block from a sinus bradycardia which is usually seen following the various fevers and prolonged nervous or physical fatigue. A rate of thirty-five or below usually means complete block. This is not affected by exercise. Mild grades of heart block usually disappear on exercise.

*Extrasystoles.* These may be defined as beats which take place prematurely in the cardiac cycle in response to pathologic impulses. These premature beats occur in response to an impulse which originates in some portion of the auricle or ventricle rather than in the pace maker. These impulses arise as a result of increased irritability in that portion of the heart initiating them. This may be the result of various causative factors, such as extrinsic nervous influences, toxic absorption from some acute or chronic infection, various drugs as digitalis and barium, and certain structural changes in the myocardium. They may arise in hypertensive hearts, the heart in pregnancy, or they may be found during fatigue or emotional excitement. Excessive accumulation of gas in the stomach may initiate premature contractions. Alcohol and tobacco are at times etiologic factors.

Premature systoles are among the most common of the cardiac irregularities. According to Lewis[1] they occur in the lifetime of every adult person. In a series of twelve hundred electrocardiograms taken at the Michael Reese heart station, eleven per cent were premature contractions (Hamburger[12]). White,[13] in a series of observations on fifteen hundred consecutive heart cases, found two hundred and fifty or seventeen per cent with premature beats. Of these one hundred and forty-seven, or about three-fifths, did not and approximately two-fifths did show organic heart disease. Of further interest is the fact that among the cases without organic disease five-sixths of the extrasystoles were of ventricular origin. The cases in this series which had organic heart disease averaged fifty-eight years of age, while the nonorganic group had an average of forty-three years. From these figures it appears that extrasystoles are of more serious import in an individual of fifty-five years than in one of forty, also that in any case of extrasystoles the chances are three to two against an associated organic disease.

Extrasystoles are seen most often in neurotic young adults, as they are more apt to consult a physician for some disturbance in their chests. The symptoms associated with extrasystoles will vary greatly, depending upon the nervous temperament of the individual. The phlegmatic patient will either not notice them, or if he does will be little disturbed. The neurotic individual, on the other hand, may be greatly upset by the queer thumping in his chest. The nervous patient may complain that they are more frequent at night just as he is about to fall asleep, others that they follow a heavy meal. Heavy smoking or emotional excitement may initiate the onset of a series of premature contractions. The actual contraction usually causes no disturbance; it is the pause which follows that causes the discomfort. If the contractions follow one another rapidly for any length of time, the individual may show considerable anxiety, numbness of the extremities, etc. The extra beats are not in themselves serious, but must nevertheless be taken as evidence of some pathologic condition in the heart.

One may often see otherwise healthy individuals who are temporarily affected, and if the cardiac muscle seems normal otherwise, no undue significance should be attached to them. Since they are often associated with serious heart disease, their presence should be sufficient to initiate a searching inquiry into the condition of that particular myocardium. It is noted above from White's[13] figures, that extrasystoles are of considerably more serious import in a man of fifty than in one of twenty years. The chances are that in the former they are evidence of considerable myocardial damage, while in the latter they are probably a purely functional disturbance. Smith[14] states that in his experience about ninety per cent of extrasystoles are found in patients with otherwise normal hearts.

The diagnosis may be readily made by ordinary methods of examination. In fact, one may at times be able to make a diagnosis from the history. For example, if a young man comes complaining of his heart, saying that at times it will give a powerful thump, seem to turn over in his chest, stop entirely for what seems to be a long time, or performs other curious movements, finally resuming its regular rate, one may be fairly safe in saying that he is suffering from extrasystoles. If these occur during examination, one notes that, while the radial pulse is quite regular for a time, there is suddenly a dropped beat which may occur at irregular or regular intervals, such as every third or fourth beat. However, if the examiner places his stethoscope over the precordium, he notes this is not truly a dropped beat at the wrist, but that a weak beat occurs prematurely in the cardiac cycle which is not, however, strong enough to produce an impulse at the wrist. He will also note what is called the compensatory pause, that is, the extra beat which is thrown in ahead of time, so to speak, leaves the ventricular muscle in a refractory state so that it is not able to respond to the regular impulse when it comes and there is a pause until the next regular impulse stimulates the ventricle to contraction. So the next ventricular impulse falls at the time it would have, had not the extrasystoles occurred. This compensatory pause does not occur when the pathologic impulse arises in the auricle. We see, then, that by listening over the precordium, while palpating the radial pulse, one may usually differentiate extrasystoles from true dropped beats or heart block. Another point in diagnosis is that, since it is well known exercise improves conduction in the heart, these extrasystoles will usually disappear on exercise.

*Paroxysmal tachycardia.* This is a condition where the heart beats very rapidly but regularly, usually one hundred and thirty to two hundred per minute, the attack stopping and starting suddenly. They are the result of an ectopic focus which temporarily overshadows the sinoauricular node and dominates the cardiac rhythm. This ectopic focus may be in the auricle or ventricle.

The majority of these cases are between the ages of twenty and thirty, although the condition may occur at any age. They may be the result of various conditions, often following an infectious disease. The attack may follow sudden exertion, a heavy meal, emotional disturbances, and flatulence or other digestive disturbances may initiate the attack. While the hearts subject to attacks may show signs of myocardial involvement, the majority do not. White[2] states that from his figures the chances of a patient with paroxysmal tachycardia having no evidence of heart disease are two to one. Laidlaw[15] says that, if associated with any evidence of heart disease, it is more commonly mitral stenosis, and a heart with mitral stenosis may be able to carry on very well until an attack of paroxysmal tachycardia occurs, when signs of heart failure may be precipitated.

The symptoms will vary according to the nervous temperament of the patient and the duration of the attack. Very few patients are so phlegmatic that they are not conscious of an attack. However, the extent of the mental distrubance may vary considerably. The attacks always come on suddenly, the patient being conscious of a sense of palpitation or fluttering in the chest, at times with considerable discomfort. If the attack lasts over half an hour, generalized effects, such as lassitude, drowsiness, coldness and sweating may be seen. Later salivation, with nausea and vomiting, may appear. If the attack persists for a period of several hours or days, we finally see the signs of heart failure, cyanosis, edema, cough with blood tinged sputum, a palpable liver, and if the attack persists, death may result.

The attack may stop as suddenly as it began, and the condition of the patient changes so rapidly as to appear almost magical. While this discussion does not include the treatment of these conditions, it is interesting to note some of the methods which may produce the sudden cessation of an attack of paroxysmal tachycardia. Bending over and placing the head between the knees seems at times to stop the attack. Ice over the precordium may at times seem to have a beneficial effect. The more commonly used method, and one which seems to be effective in about fifty per cent of the cases, is pressure over the vagus. This procedure at times appears to cut short an attack. In this connection Carter and Wedd[13] report an interesting case of paroxysmal tachycardia, in which the patient could initiate and stop the paroxysms of tachycardia at will. This would seem to show there is some times at least an extracardiac factor in this arrhythmia. Points to remember in diagnosing paroxysmal tachycardia are the sudden beginning and ending of the tachycardia, its control often by pressure on the vagi; the ventricular rate is unchanged by any change in position or by exercise.

*Auricular flutter* is a condition in which the auricles are beating very rapidly, two hundred to three hundred per minute, but all the auricular impulses not going through to the ventricle which responds only to every second or third beat of the auricle. Lewis and his coworkers have shown that the impulse travels in a never ending circle through the auricular muscle, the so-called circus movement. The auricular ventricular node, having a refractory period longer than the ventricular or auricular muscle, the impulses arrive while the node is in a refractory state, and are thus not transmitted to the ventricular muscle. It is usually a two to one block which prevails, and we see a ventricular rate of one hundred to a hundred and fifty.

Auricular flutter is one of the uncommon arrhythmias, and its recognition other than by graphic methods is not easy. It may occur at any time of life but commonly appears in patients in the latter half of life, as the conditions producing it are usually various forms of myocardial degeneration. Diphtheria, rheumatism and syphilis are also listed as causative agents.

Even though diagnosis by other than graphic methods is not easy or always possible, there are certain clinical observations which will lead one to strongly suspect flutter. It may be confused with an attack of paroxysmal tachycardia, but flutter usually occurs in those past middle life, while paroxysmal tachycardia most often affects those between the ages of twenty and thirty. Paroxysmal tachycardia is characterized by its sudden onset and cessation, with usually no evidence of organic disease. Flutter may be recognized clinically at times by the very rapid pulsation in the jugular veins. The rate in flutter is doubled on exercise, since exercise improves conduction.

*Auricular fibrillation* is the most common disorder of the heart beat, making up forty per cent of the arrhythmias according to Lewis. If one were able to recognize auricular fibrillation and extrasystoles, he would be able to diagnose seventy-five per cent of the cardiac arrhythmias. Carlton[17] says that between sixty and seventy per cent of all cases of heart failure have this disturbance, and only rarely is it necessary to employ graphic methods to confirm the diagnosis.

Auricular fibrillation is a disturbance in the regulating mechanism of the heart beat, in which the normal systole of the auricle is replaced by a fibrillary or twitching action, the auricle remaining in a state of diastole. Here, as in flutter, the impulses follow the "circus movement," except that in fibrillation they travel at the rate of four hundred and fifty to five hundred per minute, and follow a very irregular course, as many of the fibers may be in a refractory state at a given time with the impulse traveling wherever it can find muscle not in the refractory state. The auricular ventricular node is unable to transmit all of these impulses coming at such a rapid rate and irregular intervals, with the result that we see a totally irregular ventricular action.

Fibrillation may be permanent or temporary, the great majority being permanent. Mitral stenosis and myocardial degeneration are the organic lesions most commonly found with fibrillation. Hyperthyroidism may often be a cause, but these are usually of a transient type. Fibrillation may occur in the course of the various fevers, particularly rheumatic fever or pneumonia. Much the same causes seem to be responsible for paroxysmal fibrillation as for paroxysmal tachycardia, namely, fatigue, indigestion, overexertion and the various infections. The great majority of cases of permanent fibrillation will show organic heart disease. According to White[15] the chances are at least ten to one that there will be evidence of organic disease. The morbid anatomy shows valvular lesions, principally mitral, cardiac enlargement, degeneration of the heart muscle and inflammatory changes. In a very small percentage of cases no lesion will be found at autopsy.

The recognition of auricular fibrillation is not difficult in most cases. We find a rapid and totally irregular pulse, one that is irregular as to rate, rhythm and volume. There is a pulse deficit, as many of the beats heard over the precordium are too weak to reach the wrist. The more rapid the rate, the great the pulse deficit. Lewis[1] says that an irregular ventricle of one hundred and twenty or over is in all probability auricular fibrillation. It is made worse by exercise. The associated symptoms may be mild or grave, depending upon the ability of the heart to maintain an efficient circulation. There are patients with a small degree of myocardial insufficiency and a slow rate who may maintain a fairly efficient circulation over a considerable period of time. The majority of cases, however, will show signs of circulatory failure, as dyspnea, cyanosis, edema, diminished urinary output, enlarged liver, etc. The prognosis is entirely dependent upon the integrity of the myocardium and its ability to maintain an efficient circulation.

*Pulsus alternans*. This is the term applied to alternating strong and weak contraction of the heart muscles. The exact cause and mechanism are unknown, although a variety of theories and hypotheses have been advanced. It is generally agreed that this condition is an evidence of profound and widespread deterioration of the heart muscle or of severe strain. It is often noted in the senile heart, is not infrequently associated with angina pectoris, and may occur in acute infections, particularly pneumonia. Alternation of the pulse is of serious omen, no cases being reported as living over two years after recognition of the condition. It may be recognized clinically by alternating strong and weak radial pulse beats, although this it not always easy. The difference in force of the beats becomes more pronounced on exercise, and if in doubt one may apply the blood pressure cuff and cut out half the beats.

### SUMMARY

Exercise increases conductivity in the heart and may be used clinically in differentiating the various arrhythmias.

Auricular fibrillation and premature contractions make up seventy-five per cent of the cardiac irregularities. The great majority of arrhythmias seen before the age of twelve are sinus arryhthmias, and are of little significance, being simply the exaggeration of a normal phenomenon.

Heart block must be differentiated clinically from extrasystoles, which may be done usually by auscultating over the precordium while palpating the radial pulse. A ventricular rate of thirty-five or below is in all probability complete heart block. The great majority of cases of chronic heart block are due either to rheumatic fever or syphilis. Extrasystoles are of much more serious import in a man of fifty-five than in a man of twenty-five. They are most common in neurotic young adults. They will diminish or disappear on exercise.

Paroxysmal tachycardia is characterized by the sudden onset and cessation of the attack, usually lasting only a few minutes. The rate is very rapid, regular and not affected by exercise. It must be differentiated clinically from auricular flutter. Flutter usually occurs in elderly patients with a history of broken compensation, lues or rheumatism, paroxysmal tachycardia occurring usually in young adults. The rate in flutter is doubled on exercise.

An irregular pulse of one hundred and twenty or over is in all probability auricular fibrillation. It makes up forty per cent of the cardiac arrhythmias. Pulses alternans is always a sign of grave omen.

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# REMINISCENCES OF A HALF CENTURY OF PRACTICE*

G. W. KENNICOTT, M.D.
CHEHALIS, WASH.

Looking backward is the privilege of the aged, and a soothing unguentum for a younger generation with which to salve their shortcomings. I will not admit age. So, falling into the second class, I will give a fleeting glance over the almost half century that has passed like a dream since, full of hope, energy, high ideals and confidence in an optimistic ego, I entered as a D. J. (damned junior) the classic halls of Old Rush and became a very insignificant integer among about five hundred young men who in their day were to have charge of the physical and to some extent the mental and spirtual welfare of a great multitude of humanity. Men who were to make history in the medical world and in the world of science, good men, far better than the average.

They have played their little parts in the game of life. Who shall say what points they have made. Some have played in the limelight, and their names are widely known and their fame world-wide. Others have plodded along in their little round, silently, conscientiously, faithfully giving their lives to a more or less unappreciative public, asking only food, clothing and a little comfort as the shadows lengthen and their long day draws on to its close. Grand men, noble men, great men, all of them. Who shall say this one or that one is the greater? And now, like the phantoms of a dream, most of them have passed away, and only the inevitable "hic jacit" tells a rushing, clambering, restless world that these but yesterday were what you, my friends, are today.

Two winter terms of six months each had been the requirements in all first class colleges for the title of M. D. In 1882 Rush College, following some of the eastern colleges, raised this to three years of nine months each, but this was optional for a year or two, and though it offered certain advantages, it required certain scholastic standing, and some still elected to take the old two year course. Being rather young, especially in looks, my old preceptor strongly advised me to take the new course and I did so. All instruction was by lectures held mostly in the morning hours, 8 till 12, at which we were supposed to take full notes. Afternoons were given to clinics, with a running lecture on each case. Then between 5 and 6 another lecture. Then the dissecting room from 7 till 9 or 10. This made up our days. Quizzes were held mostly by little bands of students, gathered for that purpose. And, finally, the whole senior class got a grilling for two or three weeks before the final examinations.

The aim was not so much to make investigators as practical doctors, efficient practitioners; to fit men to take care of sick people, self-sufficient men who would be competent and able to depend on themselves in any emergency. Every branch of medicine and surgery, obstetrics, gynecology, pediatrics, eye, ear, nose and throat these men must care for, and in many a far-flung pioneer country settlement they found their work. And how well they did it. They had to do it. No nearby handy consultant. They were alone, even the nearest neighbor miles distant. A way must be found, and these hardy, self-sacrificing, self-sufficient men found it. Some of you older men, because but yesterday this was the front, know something of this. But to those of more recent coming it is an unknown experience, an unwritten volume.

Surgery, as we think of it today, was just in the throes of a rather difficult birth. Not that there was any lack of fine anatomists or dexterous operators. But "bugs" was a new fad, and the old masters were very conservative. Abdominal surgery was an almost unknown field, and peritonitis almost always followed any adventure into this region. Bone and brain surgery were hazardous and extremely uncertain procedures, while even slight wounds of the soft parts were expected to heal by granulation, with more or less "laudable" pus, and if perchance they healed by primary union, it was a particularly happy termination which was quite unaccountable and never or rarely brought to the operator's mind the question why.

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Surgical instruments were beautifully hand-forged of the finest steel, and after use were usually washed and dried on a piece of old chamois leather to keep them from rusting.. They were equipped with beautifully chased ebony or ivory handles, and were kept in a velvet lined mahogany box, all together a fine breeding place for bacteria. It has been said that the old family doctor frequently had a splotch on the right side of his pants, where for years he had wiped his lancet after opening a whitloe or an abscess. Then he laid it on the table and forgot it or, if it happened to be one of those pretty, convenient pocket lances, shut the blade into the handle, put it into his pocket, and was ready for the next unfortunate.

Then came Lister and antisepsis. The multitude of germs in the air must be kept out. How well I remember the first public laparotomy under this system. It was in the major surgical clinic, sleeves to our shoulders, under a 2½ per cent carbolic spray. I happened to be an assistant and I got plenty. Then iodoform, lots of it. How we smelled and, strange to say, the patient recovered. Then someone thought of asepsis. Gloves were unknown, and we scrubbed. Elaborate instructions were given as to how to do it. Our old instruments, however, were still with us, and left much to be desired. They could not be sterilized. Then the instrument men got busy, and in rapid succession came all the changes that have brought aseptic surgery as we know it today. We younger men of that day were the first to grasp the idea and put asepsis as well as we could into our work. We had no old inherited notions, and the new appealed to us.

How well I remember my first really "big case," a little fellow, his head caved in by the fall of a heavy coal chute, a bad compound comminuted condition. I had him brought to Presbyterian Hospital, placed in a free bed and prepared for operation. When I came into the operating room I found a number of the old guard, my preceptor with them. I learned afterward that the case had been somewhat widely advertised and they had come in just to see what the "young smarty" was going to do with it. My good old preceptor was worried a little, not knowing just what erratic procedure I might adopt, or how foolishly radical I might be. And when I said that I was going to open freely and make a radical operation he assured me that I was a hopeless young fool, that there would surely be an encephalitis, the boy would die, and I would be blamed for his death.

I had been particularly careful in boiling all instruments and dressings, scrubbing hands of assistants, followed by a solution of kal permanganate, then oxalic acid and bichloride and again boiled water. I went in freely and replaced the injured parts as well as I could, dressed with the moist bichloride dressings and, as the case seemed to be doing well, left them for ten days. Then one day, when the old surgeon was there, I removed the dressings. The old man stood astounded. Save for natural oozings the dressings were still clean, and the wound healed. Then the old surgeon remarked, "well, a fool for luck." But in a few short months he also was washing his hands and making his assistants do the same. And now more and more we are coming to understand, and more and more surgery is becoming a great science, a great art.

After some years of practice in one of our largest cities, I found myself on the frontier, on the very border of a vast wilderness. Roads, there were none; bridges, a few over the larger streams; and my work, every phase of practice, scattered here and there over a wide territory that could be reached only on horseback. Many times a long ride, probably in the night, would end in a narrow trail through the dense timber to a little bare cabin in the forest. In such an environment I think I have found every form of trouble that a hilarious nightmare in its happiest moments could devise, from a ten day retained placenta with a temperature of 106° and everyone in the house including the baby in the full swing of smallpox to a strangulated hernia with a foot of the gut gangrened, and my only assistant a man so drunk that he could not hold the cone after I had put the patient to sleep. There was not a vessel in that shack clean enough to boil water in, so I cut the top from a coal oil can and boiled a dirty sheet for dressings. I did an enterectomy by the smoky light of a little hand lamp, with a broken chimney, tied him up and in the early morning, just as it was getting daylight, left him with his drunken neighbor to a diet of flap jacks, bacon and sour dough bread. Of course, I thought he would die but he didn't, and about a year from that time, when he had sold his timber, he came in and paid me. He had to tell me who he was, where he came from, and what I had done for him, as I had not been able to learn any of these things.

There were still some of the old territorial doctors when I first came here, quite uneducated some of them, just natural doctors. They had drifted westward just ahead of civilization and were still "doctorin." I met one of these in the early 90's. A big hulk of a fellow. It was a confinement and he had had some difficulty and needed help. So the husband got a man and he secured a boat and came for a doctor. Learning there was a doctor from Chicago at the little hotel he came and explained his errand. I gathered up my traps, got into his boat, and landed after a ten mile pull. Then a four mile walk through the woods brought us to a little cabin and the patient, also the doctor. He seemed to be in a most happy frame of mind, and his breath, together with the lowered level of the contents of a dark bottle on the rough little mantel over the fireplace, was suggestive at least. I asked him what was the trouble. "Oh, nothing at all," he replied. "I've got it all now, all but the head," and he had, too. It was all there under the edge of the bunk in pieces. And then it was up to me. Did you ever bob for apples in a tub of water on Hallowen'en? I chased that head up and down, sideways and endwise, topside and bottomside. I finally forced it into a corner, got a finger into the foramen and a thumb into the mouth and delivered it, and through it all kept the anesthetic going with the other hand. "Doc was skeered o' chloroform" you see, and the patient had to have it. Oh yes, she got well all right.

There were no telephones, and when a doctor was needed badly some neighbor got on his horse and came to town. He was cold and wet when he got in and usually took a few drinks to keep the cold out on the road back. The doctor saddled his horse, threw on the old saddle bags, a satchel over his shoulder for instruments, etc., then off into the storm, rain, sleet or snow, and night. Dark? One could not see his horse, let alone the road, plodding along through sloppy mud, over endless corduroy, then more mud, then a narrow trail with wet ferns horse-high, sometimes absolutely lost even when the man went back with you, then on till a little cabin is found. A shout, a sleepy half-dressed man or woman, and maybe you have gone five miles too far. Turn back and search the black walls on the sides of the road for the little opening where the trail comes in. You finally get there, a little shack in the clearing.

No doubt or question as to your patient being sick, mighty sick, or they would not have sent for you. They had tried everything they knew, consulted the family doctor book from cover to cover. Now it's up to you to see him once or twice and cure him. If it's an operative case, don't for a moment think hospital. "There ain't no sich." Get out your anesthetic and instruments and operate under the soft light of a guttering candle or a sawed-off lamp. And for the after care? Well, for a few days at least he will not care for food. After that he goes back to the old diet, flap jacks, sour dough and the rest of it. Probably not a dollar in the house. You'll get it though, all of it, every cent, sometime.

Then on the long road home in the morning you may be stopped half a dozen times. They have heard that "Doc's been out to Jones'" and they are waiting at the side of the road to have you come in and see some of their ailing ones. You'll probably eat dinner at one of these places. Same old stuff, sour dough and hog meat. Then in the afternoon you get home and learn that Sam Smith, twenty miles away in another direction, has broken his leg, tree fell on him, and away you go again. Good people, kindly people, honest people. Some of the scenes seem humorous now as I look back. They were serious enough then. We gave ourselves, all that we had, the best that was in us. And so the days have crept silently away and hidden themselves in the years.

And the young doctor of yesteryear, so full of energy and hope? Well, he too has disappeared. Gone with his old horse, his old saddle bags, his nasty messes and his smelly clothes. "Yes, got so stiff he couldn't ride any more and quit." A good old fellow in his day, God bless him. More than just a doctor, friend, a consultant in times of stress. His was the hand gentle and kind that ushered them into this strange complexity we call life. His the hand that banished the ills of their growing years. And when the shadows were falling and the lamp of life fluttered and expired, his the hand, gentle as a mother's, that soothed the pain-wracked frame, and closed the tired, frightened eyes. His kindly face, the first to greet them on their forced arrival, and the last they looked upon ere they began their journey into the mysterious beyond.

The old country doctor. Let him pass, with his old horse, his saddle bags, his nasty powders and his meagre equipment. His like will never be seen again. Yet in his day, how anxiously he was awaited, how well he was known, how profoundly he was trusted. They even knew the quick cloppity-clop of his old horse, and how their strained faces relaxed, and their eyes brightened as he entered the poor little room, bringing hope and good cheer. They loved that old doctor, with his homely face and brusque ways, and now he is gone. God bless him and rest his tired old bones.

The country was rapidly developing, people were coming from all over this broad land to make their homes in this wonderful Washington. With the increase of population new conditions obtained. Roads took the place of trails, bridges were built, and many could be reached on wheels. My stout, heavy, two-wheeled "shay," with its sturdy team and big side-lights, became well known about the country. Increasing demand, however, made it necessary that I should have some place to care for patients who could not be attended at their homes or at great distances. So, about thirty years ago, I built a little hospital. Not much, only fifteen beds, but well equipped, with full trained nurses and a convenient, well-lighted operating room. This was the first hospital to be built in Lewis county, and enabled me to do work that without it I could not have done. Patients were brought on rude, home made stretchers, a blanket, or a few gunny sacks over rough poles. Then, as roads improved, other means were employed. But the people were being educated to the advantage of the hospital, and in a very short time I was relieved of much of my long distance work, and giving far better service than it had been possible to give under former conditions.

We have forged on with inconceivable strides. Wonderful paved avenues have taken the place of the old corduroy. Machines flash along at high speed where but yesterday the slow horse, or the man with a pack on his back plodded along through endless mud. Distance is eliminated and we reach people over a vast area in a moment by telephone. We have reached an age of new things, an age of concentration, hospitalization in civic centers and splendid equipment. Our colleges are training men to be high-powered investigators in various lines, specialists rather than just doctors. Efficiency is the cry. Maybe we are overdoing it. This is a question that I have no doubt the doctor of tomorrow will be fully able to answer.

Wonderful changes have taken place in the half century just passed. The old stand-bys, typhoid, diphtheria, smallpox are practically eliminated. Infant mortality, tuberculosis and a host of factors that made for human ills are being brought under control. Every year brings new evidence of the unselfish work of the members of our profession. As I look over your keen, intelligent faces and think for a moment of the fine work you are doing, I have not a regret. "The world do move." But rolling time still speeds on his way, and in just a little while, my friends, you too will be looking backward. Younger men will come, just as you came a few years ago. They will take some of your best patients, your "old stand-bys" that you were so sure of.

New ways will replace the ways with which you are familiar, new methods replace the old, and before you even guess it, you will hear yourself spoken of as "old doctor so and so." Then, quite to your surprise, you will learn that you no longer go out nights, and maybe a little later hear that you have retired and turned all your practice over to "young Dr. Jenkins." Perhaps you will be able to guess where these rumors started. Maybe they will have a familiar sound as you hark back to the days when you were the new young doctor. Then, perhaps for the first time. you will look back over the years you have unselfishly served the people. So rapidly they have passed it is a dream. You cannot realize that you are now "the old doctor."

You, who are in the prime of your work, full of energy and hope, who are just beginning the long, hard journey. You, too, will find after all it is but a short watch. Fail not to keep it, faithful to the last, true to your highest ideals as men and physicians. Your calling is high, your responsibility great and your work arduous. Yet, after all it is but a short watch, just a little while.

> "Too soon, too soon, will the noon be the afternoon,
> The afternoon be twilight gray,
> Too soon today be yesterday.
> And, life, ah, life, is but a play.
> The players strut and pass away,
> The poorest dog still has his day,
> The curtain falls, too soon, too soon."

Association of Carcinoma of Tongue and Syphilis. In ninety-two cases of cancer of the tongue reported on by George H. Belote, Ann Arbor, Mich. (*Journal A.M.A.*, June 21, 1930), seropositive evidence of syphilis occurred in 29.3 per cent. Contrasted with a 5 per cent incidence in general hospital registrations and 7.2 per cent incidence in cancer generally, this figure establishes a definite close relation between syphilis and cancer of the tongue as presumptive cause and effect. In the group studied, patients with syphilis developed cancer of the tongue on an average eight years earlier than did the nonsyphlitic patients. Leukoplakia as a forerunner to cancer occurred twice as frequently in the syphilitic as in the nonsyphilitic cases. The high incidence of syphilis in cancer of the tongue in our group did not hold true for female patients. If this group should be left out, the incidence of syphilis and cancer would be increased to 34.7 per cent.

# CONTRACT PRACTICE

A. H. Peacock, M.D.

AND

W. O. Copps, M.D., LlB.

SEATTLE, WASH.

A majority of medical practitioners are at present seriously concerned with what they consider a growing evil and a great public mischief among their own brethren, to-wit, the practice of contract doctors, and the somewhat justifiable suspicion that such gentry employ solicitors, cappers or drummers for the purpose of procuring patients, all of which acts are against public policy and inimical to public comfort and safety.

The laws of the State of Washington, Sec. 7724 of Rem. Comp. Statutes, in condensed language, give to the employers of workmen engaged in extra-hazardous employment under the Workmen's Compensation Act the right and privilege, *with the consent of a majority of their workmen and subject to the approval of the Industrial Department,* to make contracts for the furnishing of medical and surgical aid and attendance to their workmen with doctors, hospitals and hospital associations, etc. These contracts are permitted in the alternative of the general contribution to the Medical Aid Fund. The contracts are, as heretofore stated, subject to the control and supervision of the Industrial Insurance Department, and if any workman is not receiving the care and treatment required by the exigencies of his particular case, the Department may immediately revoke such contract, declare it inoperative, and remove the workman to the care of others (Eikenbary v. Smelter Co. 120 Wash., 508).

The fees for such contract work will be discussed later, but, suffice it to say, all medical fees under the Workmen's Compensation Act are now within the so-called protective wing of the Industrial Insurance Department. Under Rem. 7715, the legislature established a medical aid board which was abolished subsequently in the interests of economy (Rem. 10893), but whose duties of establishing a minimum fee bill now evolve upon the Department (Rem. 10836).

Under Rem. 7714, the workman had the option of choosing his own physician, to be paid out of the medical aid fund, but whether, in view of his bartering away his rights to a contract doctor under Rem. 7724, this right remains, is an undecided question. It seems upon reason that his choice does not remain, unless he can establish that the contract physician or hospital is inadequately equipped to care for him (Eikenbary v. Smelter, Supra).

This contract evil, learned practitioners state, exists not only with reference to the Workmen's Compensation Law, but the chief offenders are beneficial orders and lodges who employ, by way of illustration, ten doctors to care for a membership of 20,000 at a certain rate per capita or at a named salary.

The practice of medicine and surgery has long been looked upon by the general public as a profession which can only exist through a personal relation with physician and his patient. Such a relation is essentially personal and cannot be assigned and delegated with success. Consequently, the real objections to the contract system appear to be, assuming an imaginary case, that if one doctor, who is a good "business getter," lines up several contracts with a beneficial order, an industrial concern or so, and has several thousand people depending upon him for medical aid, *it becomes an impossibility to properly protect and prevent from disease, and administer to that many patients.* The contract doctor's only remedy for such a situation lies in his employment of subordinates and delegating the task to others, thereby severing that personal relationship with his patient.

Admittedly such contracts tend to create a conflict between duty and self-interest. The doctor becomes a business man and barters, bids and solicits under the noble and charitable colors of the medical cross. Such transactions affecting parties, where a strong fiduciary relationship is presumed and must exist, are righteously frowned upon in order to prevent a general public mischief.

It need not be suggested that the practice of medicine is intimately connected with the health and well being of the people of the state. Properly regulated, it becomes a source of great and widespread benefit, but without regulation it may become the source of grave harm and far-reaching danger; and so, in order that the people may be safeguarded in this respect and be reasonably sure of receiving intelligent medical treatment, the state, by virtue of its inherent power, enacts regulations for the practice of the profession, and such regulation is now universally held to be a lawful exercise of the police power (In re Thompson, 36 Wash., 377; State v. Carey, 4 Wash., 424).

Therefore, since the privilege to practice is derived from the state, it may prohibit, restrict and regulate the medical profession, due to its quasipublic nature. Since the legislature of the State of Washington has given the medical profession the right to make contracts of this nature, the sole remedy for this evil lies in its total abolition or modification by the same source which granted it, the legislature.

It is to be remembered that the Industrial Insurance Department may revoke any contract made with a doctor, under Rem. 7724, in case the Department is satisfied that said contracting doctor has not the proper facilities, or is unable to properly care for his patients. That provision is intended to be the safety valve of the right, and to prevent a doctor from contracting for more than he can do. However, experience has shown that the Department has practically sanctioned this "mass" treatment by its failure to curb it. In fact, the Department is powerless. Any contract submitted for its approval can only be denied for cause, and not for the reason that the personal relation of physician and patient is denied.

There is no doubt as to the legality of these contracts. Rem. 7712 expressly states "It is the intent to require the industries of the State to furnish medical, surgical, and hospital care to their injured workmen and to place the expense upon each industry, as near as may be, in the proportion in which it produces injury and creates expense."

Rem. 7724 expressly grants the right of the employer to so contract with a doctor or hospital. Legislative intention could hardly be more clear.

Therefore, what is the remedy? Would a law, such as Michigan enacted to provide against the employment of solicitors, cappers or drummers for the procuring of patients, be effective? The Michigan Medical Act makes it a misdemeanor for the employment of solicitors, or of any other irregular means for the procuring of patients (Public Acts of Michigan 1907, pp 209 and 218).

Some remedy must be advanced or the science of medicine will be subjected to public scorn. Mergers and combinations of doctors never eliminated yellow fever, cholera, bubonic plague, typhoid and malaria. Individuals effected that and not combinations. There was no conflict between duty and self-interest when the defensive serum to diphtheria was discovered. One never heard of the immortals, Pasteur, Lister, Koch, Reed or Noguchi, entering into an industrial contract of a mass nature.

A law curbing soliciting would stop bidding in the open, but such contracts would still be made. Consequently, one remedy would be to limit the number of patients which any hospital or doctor could assume to care for, but the constitutionality of such a law is seriously doubted. It would be subject to the objections of a denial of due process and class legislation. But an act aimed at soliciting would go a long way toward curbing this evil.

A suggested enactment is as follows:

"BE IT ENACTED by the Legislature of the State of WASHINGTON:

Sec. 1. Any physician or surgeon engaged in the practice of medicine in this State, who shall employ any solicitor, capper or drummer, for the purpose of procuring patients, or who shall subsidize any hotel or boarding house, or who shall solicit a contract with any corporation, firm or group of persons, or an industry employing workmen or individuals for the medical treatment and attendance of such workmen, or who shall pay or present to any person money or other valuable gift for bringing patients to him, or pay a percentage or contingent commission upon any contract obtained by any solicitor for any physician or surgeon, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than $500, or by imprisonment in the county jail for a period not exceeding six (6) months, or by both such fine and imprisonment in the discretion of the court."

Another remedy suggested is that all those physicians accepting industrial contracts furnish certain information to the Board of Health in those counties in which they reside and operate, such as:

"BE IT ENACTED by the Legislature of the State of Washington:. AN ACT:

"In order to afford this Board better advantages for obtaining knowledge important to be incorporated with that collected through special investigators and from other sources, it shall be the duty of all physicians and surgeons of all companies, firms, corporations or groups, organized or transacting business under the laws of this State, to furnish to the State Board of Health a monthly report of all clinical, surgical and medical treatment rendered by them, together with the name of the patient, his occupation, his ailment, discharge, the amount charged his employer for such treatment, together with a full report of any new contracts entered into by such physician or surgeon, a certified copy thereof to accompany such report, etc., or other information bearing upon the health of said workman, and which may be requested by said Board for the purpose of enabling it to better perform its duties of collection and distribution of useful knowledge on this subject, etc."

It is doubtful whether the state could void a contract between an employer and a doctor under the guise of police power. It would possibly be subject to the constitutional objection that such action would impair and abridge the right of contract, in violation of the Federal constitution.

However, the state could take away the alternative of allowing the employer to contract for treatment under the Workmen's Compensation Law and give the workman his aid solely under the Medical Fund. But this would not destroy the beneficial order medical menace, and it is earnestly believed that such orders have a legal right to so contract with doctors, no matter how much of a bargain said orders would be obtaining. It would be a matter of choice with the individual whether he wanted to accept such service or not.

Expulsion from the medical association might act as a curb, and in reiteration a law against soliciting might result in untold value, but no real remedy will ever be advanced until the State of Washington has adopted and created an entirely new Medical Practice Act. Apparently the legislature has never really taken the medical profession with a more serious view other than limiting and regulating the profession, until something serious arose and demanded its attention. Such a situation is now at hand. The State of Washington is no longer a pioneer state, and needs not adopt a policy of hesitancy in regulating professions and trades, because of its desire to attract more settlers.

Consequently, a governing State Medical Board is now of dire necessity, and the licensing of physicians and revocation thereof should be placed in the hands of professional appointees, and removed from those of the laity or the present department of licenses (Rem. 10859). So numerous are the remedies needed that a tentative Medical Practice Act is hereinafter set forth, with suggested amendments to the existing laws. Notice carefully how this new Medical Practice Act would cure the "contract" evil.

## AN ACT

Relating to the promotion and preservation of the public health and affording to the public generally the protection afforded by a standardized regulation of the medical profession, and insuring and establishing a standard of competency for those engaged in it, and repealing Sections (pick out sections in conflict herewith, 10008 to 100025 and others) of Rem. Comp. Stat.

BE IT ENACTED by the Legislature of the State of Washington:

### Sec. I. PURPOSE OF ACT

This act is designed to encourage proficiency in the practice of medicine as a profession; to promote efficiency in the practice thereof, and to extend to the public generally the protection afforded by a regulated profession, by establishing a standard of conduct and competency for those engaged in it.

### Sec. II. BOARD OF MEDICAL EXAMINERS—QUALIFICATIONS—SCOPE OF DUTIES

A board is hereby established to be known by the name and style of the State Board of Medical Examiners. Said board shall be composed of nine practicing physicians of integrity and ability, who shall be residents of, and have been licensed to practice medicine in this state, and who shall have been graduated from medical schools of high educational requirements and standing, and have been engaged in the active practice of their profession within this state. Said board shall perform such duties and possess and exercise such powers, relative to the protection of the public health and the control and regulation of the practice of medicine in this state, as shall be in this act prescribed and conferred upon it.

### Sec. III. APPOINTMENT OF MEMBERS—TERM OF OFFICE—VACANCIES

The governor shall appoint nine (9) physicians who shall possess the qualifications specified in Section II of this act, to constitute the members of said board. Said members shall be so classified by the governor that the term of office of three shall expire in two (2), three in four (4), and three in six (6) years from the date of appointment. Biennially thereafter, the governor shall appoint three members, who shall possess the qualifications as specified in Section II of this act, each to serve for the term of six (6) years; and he shall fill vacancies in the membership of said board, as soon as practicable.

### Sec. IV. OFFICERS—REGULATIONS—APPLICANTS FOR LICENSES

Said board shall biennially elect a president, a vice-president and a secretary-treasurer from their membership, and shall adopt a seal which shall be affixed to all licenses issued by them. They shall, from time to time, adopt such rules and regulations as they deem necessary for the performance of their duties, and a schedule of minimum educational requirements, which shall be without prejudice, partiality or discrimination as to schools or systems of practice of medicine. When an applicant for a license offers to the board satisfactory proof that he has complied with such educational requirements as are specified in said schedule, the board may accept such proof as sufficient evidence of the educational qualifications of the applicant to entitle him to take the medical examination required herein.

### Sec. V. MEETINGS OF BOARD

The State Board of Medical Examiners shall meet as a board of medical examiners in the City of Seattle on the first Tuesday of January, April, July and October of each year, and at such other times and places as may be found necessary for the performance of their duties.

### Sec. VI. APPLICATION TO PRACTICE—UNLAWFUL TO PRACTICE WITHOUT LICENSE

Any person wishing to obtain the right to practice medicine in this state, who has not heretofore been licensed so to do, shall, before it shall be lawful for him to practice medicine in this state, make application to said State Board of Medical Examiners, through the secretary-treasurer thereof, upon such form and in such manner as shall be adopted and prescribed by the board, and obtain from the board a license so to do. Unless such person shall have obtained a license as aforesaid it shall be unlawful for him to practice medicine in this state; and if he shall practice medicine in this state, without first having obtained such a license, he shall be deemed to have violated the provisions of this act. All applicants for a license to practice medicine or for a renewal of any such license which has been revoked, shall furnish the board with satisfactory evidence of good moral character.

### Sec. VII. EXAMINATION FEE

Each applicant, on making application, shall pay the secretary of the board a fee of twenty-five ($25) dollars, which shall be turned over to the treasurer of the board, who shall retain fifteen ($15) dollars of the fee in his possession until the board shall have passed upon the credentials of the applicant, and in case they are insufficient the sum of fifteen ($15) shall be returned upon application.

All money received or collected by said board or any member or officer thereof during any month, shall be turned over before the tenth day of the succeeding month to the state treasurer, together with a verified statement showing the sources from which such money was derived. The treasurer of said board shall give security bond to be approved by and deposited with the auditor of the state in the sum of one thousand dollars ($1000). The cost of said bond shall be paid by the state.

Each member of the board of Medical Examiners shall receive a compensation of ten dollars ($10) per day for each day in which he is actually and necessarily engaged in attendance upon meetings of the board, in going to and returning from the place of meeting, and all necessary expanses incurred in attending such meetings. All such compensation and expenses, and all other expenses incident to the execution of the provisions of this act shall be paid by the state treasurer upon warrants drawn by the state auditor upon the presentation of proper vouchers to be approved by a majority of said board, as in the case of state officers. The secretary and treasurer of said board shall receive a compensation to be determined by said board, not to exceed fifty dollars per annum.

### Sec. VIII. CERTIFICATES OF PRACTICE—QUALIFICATIONS

Only one form of certificate shall be issued by the said board (State Medical Examiners). Such certificate shall be under the seal of the board and signed by the president and secretary, and shall authorize the holder thereof to practice medicine and surgery within this state. Upon compliance with the requirements of this act by an applicant for a license to practice medicine and surgery in this state, the board shall issue such certificate, authorizing the holder thereof to use drugs or what are known as medicinal preparations in or upon human beings and to sever or penetrate the tissues of human beings and to use any and all other methods in the treatment of diseases, injuries, deformities or other physical or mental conditions.

In order to procure a certificate to practice medicine and surgery, the applicant for such certificate must file with said board, at least thirty days prior to a regular meeting thereof, satisfactory testimonials of his moral character, and a diploma issued by a legally chartered medical school, the requirements of which have been at the time of granting such diploma in no particular less than those prescribed by the Association of American Medical Colleges for that year, or satisfactory evidence of having possessed such diploma, and he must file with such diploma an application sworn to before some person authorized to administer oaths, and attested by the hand and seal of such officer, if he have a seal, stating that he is the person named in said diploma, that he is the lawful holder thereof, and that the same was procured in the regular course of instruction and examination, without fraud or misrepresentation. Said applicant must furnish evidence that he has served for not less than one year as interne in a thoroughly equipped hospital which shall have had at least twenty-five beds for each interne devoted to the treatment of medical, surgical, gynecologic and special diseases, and he also must have had a service of six weeks or the equivalent thereof in the maternity department of the same or some other hospital, during which time he shall have attended or participated in the attendance upon not less than six confinements. He shall furnish evidence that he has had some experience in, and a practical working knowledge of pathology, and the administration of anesthetics. The said application shall be made upon a blank furnished by said board, and it shall contain such information concerning said medical instruction and the preliminary education of the applicant as said board may by rule provide. Applicants who have failed to meet the requirements must be rejected.

### Sec. IX. SUBJECTS OF EXAMINATION—QUESTIONS AND PAPERS

In addition to the requirements above set forth, such applicants for a certificate must be personally examined by said board as to their qualifications. The examination shall be conducted in the English language, shall be practical in character, and designed to discover the applicant's fitness to practice medicine and surgery and shall be, in whole or in part, in writing on the following fundamental subjects, to-wit: Anatomy, histology, gynecology, pathology, bacteriology, chemistry, toxicology, physiology, obstetrics, general diagnosis, hygiene, practice of medicine and surgery and any other branches thereof that the board shall deem advisable. Examinations in each subject shall consist of not less than ten questions, answers to which shall be marked upon a scale of zero to ten. All applicants must obtain not less than seventy-five per cent in any one subject: Provided, that applicants who can show at least ten years of reputable practice shall be granted a credit of five per cent upon the general average, and five per cent additional for each subsequent ten years of such practice. The examination papers shall form a part of the records of the board and shall be kept on file by the secretary for a period of one year after each examination. In said examination the applicant shall be known and designated by number only, and the name attached to the number shall be kept secret until after the board has finally voted upon the application.

### Sec. X. RECORDS OF BOARD

Said board shall keep an official record of all its proceedings, a part of which record shall consist of a register of all applicants for certificates under this act, with the result of each application. Said record shall be evidence of all the proceedings of said board which are set forth therein.

### Sec. XI. CERTIFICATES RECORDED WITH COUNTY CLERK

Every person, holding a certificate authorizing him to practice medicine and surgery in this state, must have it recorded in the office of the county clerk of the county in which the holder of said certificate is practicing his profession, and the fact of such recording shall be indorsed on the certificate by the county clerk recording the same. Every such person, on each change of his residence, must have the certificate recorded in the county to which he shall have changed his residence. The absence of such record shall be prima facie evidence of the want of possession of such certificate. And any person holding a certificate to practice medicine and surgery in this state who shall attempt to practice medicine or surgery in this state, without first having filed his certificate with the county clerk as herein provided, shall be guilty of a misdemeanor.

### Sec. XII. CLERK'S RECORD OF CERTIFICATES

The county clerk shall keep in a book, provided for the purpose, a complete list of the certificates recorded by him, with the date of the record; and said book shall be open to public inspection during his office hours. The county clerk shall forthwith give written notice to the secretary of the board, notifying him of the name of each licensee recorded after this act shall go into effect, together with the date of such recording.

### Sec. XIII. UNPROFESSIONAL CONDUCT—REFUSAL OR REVOCATION OF LICENSE—PROCEDURE

Said board must refuse a certificate to any applicant guilty of unprofessional conduct; but before such refusal the applicant must be cited by citation, signed by the secretary of the board, and sealed with its seal. No such citation shall be issued except upon a sworn complaint filed with the secretary of the board, charging the applicant with having been guilty of unprofessional conduct, and setting forth the particular act constituting such unprofessional conduct. On filing of such complaint the secretary must forthwith issue a citation and make the same returnable at a regular or special meeting of said board, occurring at least thirty days next after filing the complaint. Such citation shall notify the applicant of the time and place when and where the matter of said unprofessional conduct shall be heard, the particular unprofessional conduct with which the applicant is charged, and the applicant shall file his written answer, under oath, within twenty days next after service upon him of said citation, or default will be taken against him, and his application for certificate refused.

The attendance of witnesses at such hearing shall be compelled by subpoenas issued by the secretary of the board under its seal; and said secretary shall in no case refuse to issue any such subpoena, upon a fee of twenty cents being paid him for each subpoena. Said citation and said subpoena shall be served in accordance with the statutes of this state then in force as to the service of summons and subpoenas generally, and all provisions of the statutes of this state then in force relating to subpoenas are hereby made applicable to the subpoena provided for herein. If any person refuses to obey a subpoena served upon him in accordance with the statutes of this state then in force providing for the manner of serving subpoenas, the fact of such refusal shall be certified by the secretary of said board, under the seal thereof, to the superior court of the county in which the service was had, and the said court shall thereupon proceed to hear said matter in accordance with the statutes of this state then in force as to contempt for disobedience of process of the court, and should said court find that the subpoena had been legally served and that the party so served has willfully disobeyed the same, it shall proceed to impose such penalty as provided in cases of contempt of court.

In all cases of alleged unprofessional conduct arising under this act, testimonies of witnesses may be taken, the same as in civil cases, and all the provisions of the statutes of this state then in force as to the taking of testimony are hereby made applicable to the taking of depositions under this section. If the applicant shall fail to file with the secretary of said board his answer under oath to the charges made against him, within twenty days after service on him of said citation or within such further time as the board may give him, and the charges on their face be deemed sufficient by the board, default shall be entered against him and his application refused. If the charges on their face be deemed sufficient by the board, and issue be joined thereon by answer, the board shall proceed to determine the matter, and to that end shall hear such evidence as may be adduced before it; and if it appear to the satisfaction of the board that the applicant is guilty as charged, no certificate shall be issued to him. No certificate shall be refused on the grounds of unprofessional conduct unless the applicant has been guilty of such conduct within two years next preceding his application.

Whenever any holder of a certificate to practice medicine and surgery in this state is guilty of unprofessional conduct, as the same is defined in this act, and said unprofessional conduct has been brought to the attention of the board in the manner hereinafter pointed out, or whenever a certificate has been procured by fraud or misrepresentation, or issued by mistake, it shall be their duty to, and they must, revoke the same at once, and the holder of said certificate shall not be permitted to practice medicine and surgery in this state. But no such revocation shall be made unless such holder is cited to appear and the same proceedings are had as is hereinbefore provided in this section in case of refusal to issue certificates. Said secretary in all cases of revocation shall enter on his register the fact of such revocation and shall certify the fact of such revocation under the seal of the board, to the county clerk of each county in which the certificate of the person whose certificate has been revoked is recorded; and said clerk must thereupon write upon the margin or across the face of his register of the certificate of such person, the following: "This certificate was revoked on the ——— day of ———," giving the day, month and year of revocation in accordance with certification to him by the secretary. The record of such revocation so made by said county clerk shall be prima facie evidence of the fact thereof, and of the regularity of all the proceedings of said board in the matter of revocation. From the time of the revocation of a certificate the holder thereof shall be disqualified from practicing medicine or surgery in this state.

## Sec. XIV. CONDUCT AND ETHICS OF MEDICAL PROFESSION

The code of ethics of the American Medical Association shall be the standard of ethics for those permitted and licensed to practice medicine in the State of Washington.

## Sec. XV. PHYSICIAN'S OATH

Every physician or surgeon, before being issued a certificate or license to practice medicine in the State of Washington, shall take the oath of Hypocrates before a majority of the Medical Board.

## Sec. XVI. ACTS CONSTITUTING UNPROFESSIONAL CONDUCT — REFUSAL AND REVOCATION OF LICENSES

The words "unprofessional conduct," as used in this act, are hereby declared to mean:

First. The procuring or aiding or abetting in procuring a criminal abortion.

Second. The willfully betraying of a professional secret.

Third. All advertising of medical business which is intended or has a tendency to deceive the public or impose upon credulous or ignorant persons, and so be harmful or injurious to public morals or safety.

Fourth. All advertising of any medicine or of any means whereby the monthly periods of women can be regulated or the menses reestablished if suppressed.

Fifth. Conviction of any offense involving moral turpitude, in which case the record of such conviction shall be conclusive evidence.

Sixth. Habitual intemperance.

Seventh. The personation of another licensed practitioner.

Eighth. Wrongfully encouraging or conspiring with any person to bring, or cause to be brought, any action in any court against any licensed practitioner for alleged malpractice, or agreeing with any person for a share or part of any sum of money to be recovered in such action: Provided, that nothing herein shall be construed to prevent any licensed practitioner from testifying against any other licensed practitioner in any action for alleged malpractice.

Ninth. The employment of fraud or deception in applying for or securing a license, or in passing the examination provided by this act.

Tenth. Gross negligence or ignorant malpractice.

Eleventh. The obtaining of a fee, either directly or indirectly, either in money or in the form of anything of value or in the form of financial profit, either as personal compensation or as compensation, charge, profit or gain for an employer, or any other person or persons, on the representation that a manifestly incurable, sick, diseased or injured condition of any person can be permanently cured.

Twelfth. The violation of any provision of this act or of the code of ethics of the American Medical Association, or the violation of his or her oath as a doctor, or of his or her duties as a physician or surgeon.

### Sec. XVII. REASONS FOR REVOCATION FILED

In any case of the refusal or revocation of a license by said board under the provisions of this act, said board shall file a brief and concise statement of the grounds and reasons for such refusal or revocation in the office of the secretary of said board, which said statement, together with the decision of said board, in writing, shall remain of record in said office.

### Sec. XVIII. APPEAL FROM ORDER OF BOARD—NOTICE, BOND, ETC.

In any case of the refusal or revocation of a license by said board under the provisions of this act, the applicant whose application shall be refused, and the licentiate whose license shall be so revoked by said board, shall have the right to appeal from the decision so refusing or revoking such license within thirty days after the filing of such decision in the office of the secretary of said board, as hereinbefore in this act provided. Such appeal shall be to the superior court in and for the county in which was held the last general meeting of said board, prior to the refusal of such license, in the case of such refusal; and to the superior court in and for the county in which the hearing was had upon which such license was revoked, in case of such revocation. In any case a person desiring to take such appeal shall serve or cause to be served, upon the secretary of said board, a written notice of such appeal, which shall contain a statement of the grounds of such appeal, and shall file in the office of such secretary an appeal bond, with good and sufficient surety, to be approved by said secretary, to the State of Washington, conditioned for the speedy prosecution of such appeal, and the payment of such cost as may be adjudged against him upon such appeal. Said secretary shall within ten (10) days after the service of said notice of appeal, and the filing and approval of said appeal bond, transmit to the clerk of the superior court to which such appeal is taken, a certified copy, under the seal of said board, of the decision of said board, and the grounds thereof in the case of the refusal of the license; and in addition thereto, a certified copy under such seal of the complaint in the case of the revocation of a license, together with the bond and notice of appeal. The clerk of such court shall thereupon docket such appeal causes, and they shall stand for trial in all respects as ordinary civil actions, and like proceedings be had thereon. Upon such appeal said cause shall be tried de novo. Either party may appeal from the judgment of said superior court to the supreme court of the state in like manner as in civil actions within sixty (60) days after the rendition and entry of such judgment in said superior court. If such judgment shall be in favor of the party appealing from the decision of said board, and in case said examining board does not appeal from said judgment within sixty (60) days, then, and in that case, said board shall, at the end of said sixty (60) days, and immediately upon the expiration thereof, issue to such successful party the usual license to practice medicine and surgery in this state, and in addition thereto shall reinstate upon the records of said board the name of such successful applicant, in case of the revocation of his license by such board. In case of such appeal to the supreme court by said board, no such license shall be issued nor reinstatement be required until the final determination of said cause and as hereinafter provided. In case the final decision of the supreme court be against said medical examining board, then, and in that case, said court shall make such order in the premises as may be necessary, and said board shall act accordingly: Provided, that in no case shall an appeal bond be required of said board, nor shall any costs be adjudged or taxed against the same.

### Sec. XIX. PRACTICE OF MEDICINE DEFINED

The term "practice of medicine," as used in this act, is hereby defined to mean holding out one's self to the public as being engaged within this state in the business of diagnosing or treating diseases, injuries or defects of human beings; whether by the use of drugs, surgery, manipulation, electricity or any other physical or mechanical means whatsoever; or the suggestion, recommendation or prescribing of any form of treatment for the intended palliation, relief or cure of any physical or mental ailment or defect of any person with the intention of receiving therefor, either directly or indirectly, any fee, gift or compensation whatsoever; or the maintenance of an office for the examination or treatment of persons afflicted with disease, injury or defect of body or mind; or using the title M.D., doctor, surgeon, or any word or abbreviation to indicate or induce others to believe that one is engaged in the treatment or diagnosis of the diseases, injuries or defects of human beings; using any such title other than optician or optometrist to indicate that one is engaged in the business of refracting or fitting glasses to the human eye; or performing any kind of a surgical operation upon a human being; or the practice of midwifery; or attending a woman in childbirth without the aid of a licensed physician and surgeon or a licensed midwife. If any person who does not possess and shall not have filed a license to practice medicine within this state, as hereinabove provided, shall do any of the acts hereinabove mentioned as constituting the practice of medicine, he shall be deemed to be practicing medicine without complying with the provisions of this act and in violation thereof.

Nothing in this act shall be construed to prohibit gratuitous services in case of emergency or to prohibit a physician lawfully practicing in another state or territory from attending a particular case in this state which he is called to diagnose or treat; nor the practice of midwifery as hereinbefore defined by a duly licensed midwife, but the practice of midwifery by any person who does not hold a license to practice medicine or a license to practice midwifery issued by the state board of medical examiners, shall be deemed to be practicing medicine without a license in violation of this act; nor the practice of chiropody as hereinafter defined by a duly licensed chiropodist, but the practice of chiropody by any person who does not hold a license to practice medicine or a license to practice chiropody issued by the state board of medical examiners, shall be deemed and considered to be practicing medicine without a license in violation of this act; nor to prohibit the practice of optometry under the conditions and limitations defined in Sec. 10147 to 10163 inclusive, of Rem. Comp. Stat. of the State of Washington; nor to prohibit the practice of religious tenets or religious rites or ceremonies as a form of religious worship; or to prohibit commissioned surgeons of the United States army, navy or public health and marine hospital service, from performing their lawful duties in this state as such officers.

### Sec. XX. PRACTICING WITHOUT LICENSE—PENALTY

Any person who shall practice or attempt to practice, or hold himself out as practicing medicine and surgery in this state, without having, at the time of so doing, a valid, unrevoked certificate as provided in this act, shall be guilty of a misdemeanor. In each such conviction the fine shall be paid, when collected, to the state treasurer, and shall constitute a special fund for the prosecution of illegal practitioners as defined in this act, and the said board is authorized to prosecute all persons guilty of a violation of the provisions of this act.

### Sec. XXI. FALSE PERSONATION, A FELONY

Every person filing for record, or attempting to file for record, the certificate issued to another, falsely claiming himself to be the person named in such certificate, or falsely claiming himself to be the person entitled to the same, shall be guilty of a felony, and, upon conviction thereof, shall be subject to such penalties as are provided by the laws of this state for the crime of forgery.

### Sec. XXII. FRAUDULENTLY ACTING AS MEMBER OF BOARD

Any person assuming to act as a member of the state board of medical examiners without so being, or who shall sign, or subscribe, or issue, or cause to be issued, or seal, or cause to be sealed, a certificate authorizing any person to practice medicine or surgery in this state, shall be guilty of a misdemeanor.

### Sec. XXIII. LICENSES ISSUED WITHOUT EXAMINATION—THEIR REVOCATION

Any person who shall have been lawfully engaged in the practice of the healing art in the State of Washington, for not less than three (3) months immediately prior to the date upon which this act takes effect, and is a graduate from an institution chartered to teach the healing art, by the state wherein it was located, which school, in case the practitioner graduated therefrom prior to January 1, 1911, required such practitioner to be in actual attendance for two (2) years of nine (9) months each of not less than 100 hours of instruction work in each of those years in order to graduate, and which school, in case the practitioner graduated therefrom subsequent to January 1, 1911, required the practitioner to be in actual attendance for three (3) years of nine (9) months each of not less than one thousand (1000) hours of instruction work in each of those years in order to graduate shall be granted a license to practice medicine in the State of Washington by the State Board of Medical Examiners, without examination as to his skill; provided further, that each practitioner shall make application to the said Board of Medical Examiners for such license within ninety (90) days after the date upon which this law takes effect, upon such blank forms as said board shall provide, and shall pay the fees herein prescribed, and shall furnish evidence satisfactory to the board that he is a person of good moral character and possesses the educational qualifications hereinabove specified; provided, however, that all licenses herein mentioned may be revoked for unprofessional conduct in the same manner and upon the same grounds as if issued under this act.

### Sec. XXIV. LAWS TO BE OBSERVED

All persons granted licenses or certificates under this act shall be subject to the state and municipal regulations relating to the control of contagious diseases, the reporting and certifying to births and deaths, and all matters pertaining to public health; and all such reports shall be accepted as legal.

### Sec. XXV. SOLICITING BUSINESS PROHIBITED

Any physician or surgeon engaged in the practice of medicine in this state, who shall employ any solicitor, capper or drummer for the purpose of procuring patients, or who shall subsidize any hotel or boarding house, or who shall solicit a contract with any corporation, firm or group of persons or an industry employing workmen or individuals, for the medical treatment and attendance of such workmen, or who shall pay or present to any person, money or other valuable gift for bringing patients to him, or pay a percentage or contingent commission upon any contract obtained by any solicitor for any physician or surgeon, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not more than five hundred ($500) dollars, or by imprisonment in the county jail for a period not exceeding six (6) months, or by both such fine and imprisonment in the discretion of the court.

### Sec. XXVI. CONTRACTING WITH EMPLOYERS FOR TREATMENT OF WORKMEN—LODGES—BENEFICIAL ORDERS

On or after June 10, 1931, all physicians and surgeons, hospitals or associations engaged in the healing art, who accept contracts from employers of workmen for the treatment of said workmen, from beneficial orders, or from lodges for the treatment of their members and families, at a contract price, shall not accept any direct payment from said contracting parties until the following requisites hereby made and provided are complied with:

First. All such contracts, immediately upon their being made and entered into, shall be filed of record in each of the following places: one with the secretary of the State Medical Board, one with the Department of Labor and Industries, and one with the county auditor in the county where the work is to be performed.

Second. A penal bond shall be executed to the state in the sum of Five Thousand ($5000) Dollars by all physicians, surgeons, hospitals or associations engaging in the contract practice of medicine; such bond shall be filed with the Secretary of State to insure faithful performance and a guarantee of good faith in the execution of said contracts; and upon the failure of the said physicians, surgeons, hospitals or associations to perform their part of the agreement, the said Secretary of State shall immediately declare such bond forfeited and interplead the same into the Superior Court of the State of Washington for Thurston County, and the court shall then order it to be disbursed in mitigation of any damages sustained by reason of said physicians', surgeons', hospital's or association's failure to perform; provided, however, that in no event shall the employer, lodge or party employing said physician, surgeon, hospital or association be entitled to any part of said bond, and in the event no damage is manifest, or claims advanced therefor, the court shall enter an order declaring said bond forfeited and pay the whole sum into the State Treasurer's Office.

Third. All payments to be made under said contracts shall be first paid into, and addressed by the employer, to the Department of Labor and Industries, to be then and there examined by the said Department in conformity with the contract on file, and if satisfied that the payments are in conformity with said contract, the Department shall in turn forward the said sum to the physician, surgeon, hospital or association entitled to the same; provided, however, the Department of Labor and Industries shall keep an account of all such payments made as herein defined, and submit a quarterly report to the State Medical Board of all such payments made, together with a short summary of the contract involved, its file number, and its recommendations as to the faithful performance of the physician, surgeon, hospital or association under said contract insofar as the same affects the health and comfort of the persons or group being treated.

Fourth. All rates and contract prices for the treatment of workmen in the State of Washington shall not be for a less sum than that established by the Department of Labor and Industries' minimum fee as provided in Rem. 7715; provided, however, that this subsection shall have no application to lodges and beneficial orders, but is expressly directed towards the betterment of the treatment of injured workmen and for the curbing of a growing and pernicious practice among employers to engage cheap and inefficient medical aid for such treatment.

Fifth. No physician, surgeon, hospital or association shall accept or assume any contract for the treatment of injured workmen, or any group of persons including beneficial orders and lodges, where such physician, surgeon, hospital or association is situated or resides more than fifteen (15) miles from the place where such workmen are engaged in their labors, or where the lodge or organization has its headquarters; nor shall any person accept such contract and assign the same to a subordinate or group thereof in order to evade the plain intention of this provision; provided further, that no person, groups, physician, surgeon, hospital or association, having an office or clinic in one incorporated city in this state, shall accept such contracts for the treatment of patients in another such city or town at more than a fifteen (15) mile radius from said clinic or office of said physician, surgeon, hospital or association.

### Sec. XXVII. DIAGNOSING OR TREATMENT FOR UNLICENSED EMPLOYER OR PARTNER UNLAWFUL — NOT APPLIED TO CORPORATION PRACTICE

It is hereby declared to be unlawful for any person to examine for the purpose of diagnosing, or to diagnose or treat any person suffering from any disease, diseased condition, injury or defect as the partner, agent or employee of any person who does not hold a license to practice medicine within this state, or as the employee of any corporation, and it shall be no defense to any person prosecuted under this section that he held a license to practice medicine in this state at the time of such examination or treatment, if section XXI above is complied with.

### Sec. XXVIII. LIABILITY OF NONPRACTITIONERS

It is hereby declared to be unlawful for any person not licensed to practice medicine to receive, either directly or indirectly, any pay or compensation given or paid in violation of the foregoing section of this statute, and any person who receives any such pay or compensation shall be punished in the same manner and to the same extent as is provided in the foregoing section of this act for the person giving or paying such pay or compensation.

### Sec. XXIX. LICENSES OF OTHER STATES

Applicants for a certificate, who have been examined and licensed by a state board of medical examiners of another state and have practiced at least one year therein, which through a reciprocity provision in its law, similarly accredit the holders of certificates from the board of medical examiners of this state to the full privileges of practices within its borders, on payment of a fee of twenty-five dollars to the board, and on filing with the secretary of the board a copy of such license certified by the president or secretary of the state board of medical examiners issuing the same to be a full, true copy thereof, and showing also that the standard of requirements adopted by such state board of medical examiners as provided by the law of such state is equal to that provided for by the provisions of this act, shall without further examination receive a certificate to practice medicine and surgery in this state: Provided, that such applicant has not previously failed at an examination held by the board of medical examiners of this state.

### Sec. XXX. APPLICATION AND CONSTRUCTION OF ACT

Nothing in this act shall be construed to prohibit service in the case of emergency, or the domestic administration of family remedies, or the practice of midwifery; nor shall this act apply to any commissioned medical officer in the United States army, navy or marine hospital service, in the discharge of his official duties; nor to any licensed dentist when engaged exclusively in the practice of dentistry; nor shall this act apply to any practitioner from any other state or territory in which he resides: Provided, that such practitioner shall not open an office or appoint a place of meeting patients or receive calls within the limits of this state. This act shall not be construed to apply in any manner to the practice of osteopathy or to any drugless method of treating the sick or afflicted, or to apply to or interfere in any way with the practice of religion or any kind of treatment by prayer; nor to any person now holding a license from the state board of medical examiners for any system of drugless practice.

### Sec. XXXI. "CERTIFICATE" AND "LICENSE" SAME

The words "certificate" and "license" shall be known as interchangeable terms in this act.

This suggested act is not intended to be conclusive, but is merely a rough draft of a needed remedy. Suggestions of improvements thereon should be forwarded to the proper committee, and all such suggestions will receive earnest consideration. All sections in conflict with this suggested act, or all laws of the State of Washington now in conflict therewith, will be sifted and amended to conform with the intention of the majority of practitioners in this state.

The legal profession is regulated by lawyers, and not by laymen, as the medical profession is now regulated. The State Board of Medical Examiners was abolished in the interests of economy. The State Board of Medical Examiners should be reestablished in the interests of public comfort and health. Once the medical profession is placed under the control of competent medical practitioners, public comfort and health will be safeguarded, and arbitrary and capricious conduct on the part of a State License Board composed of laymen will be removed.

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# EDITORIAL

## REGULATION OF CONTRACT PRACTICE

Contract practice is a subject of perennial debate and conference in many county societies. Often times it has engendered strife and bitterness that have persisted over long periods. Although at different times certain societies have attempted to control or discipline their members regarding this sort of practice by resolutions forbidding such work, or imposing the penalty of expulsion if persisted in, it has continued and expanded with increase of population and development of industry. Practice of medicine by means of the contract system has become an established feature in the profession. Neither by resolutions nor opposition can physicians hope to obliterate it or prevent its expansion. Attempts to discipline members of the society who have participated in this form of practice have accomplished no results. It is always regrettable when efforts to regulate this practice by a medical society terminate only in developing animosities and ill feeling among its members.

The profession must face the fact that this is an established procedure and should unite in some method for its equitable control and regulation. All seem agreed that this can be accomplished only by legislation, which shall establish a uniform method of dealing with contract work among all cities and counties of the state. In order that such a course may be pursued, it is essential that someone should take the initiative and offer a plan which may be suggestive and possibly serve as a model for effective action. In this issue will be found a paper by Peacock and Copps who have made a study of this question and offer a suggestive act for legislative consideration to cover the various problems which have arisen in connection with this subject. The procedures contained in this paper are not sponsored by this journal, nor are they endorsed by any medical organization. They are offered by the authors for what they may be considered worth, with the hope that the suggestions may serve as a basis for future legislative action which may prove a solution to the much debated and disturbing contract practice. Suggestions or criticisms of the measures therein outlined are invited. This journal will publish anything received along these lines in order to help clarify the situation and aid in solving the problems under consideration.

## ABUSE OF BROADCASTING

The radio, like the automobile, seems to have become an established institution in the families of this country. Its perfection in operation and its amazing popularity are outstanding features of modern society. It is not surprising that it has been seized upon with avidity as a means of advertising in many lines of business and professional activities. This has become so objectionable in the minds of some people that an agitation has been suggested to persuade the Government authorities controlling broadcasting to prohibit advertising of wares which intrudes itself practically into all the families of a community. The acme of offense in this line appears in the broadcasting by medical advertisers, which has become an outrageous insult as it is obtruded into the family circle which must oftimes unwittingly listen in on what is transmitted through the air. It is incomprehensible that the Government authorities should permit the ignorant and blatant assurances which are broadcast in some communities by these medical quacks who seem to have obtained the services of certain stations. One hears the stereotyped assertions which these men proclaim as to their ability to cure disease without the use of the knife, drugs or other methods which have been established through the experience of years. Some method should be adopted for the elimination of this form of deception which is being transmitted broadcast among the citizens of our land.

## WASHINGTON EXTENSION LECTURES

Physicians of Washington and its neighborhood should keep in mind the Postgraduate Course to be presented by the Extension Department of the University of Washington which will be held in Seattle July 14-18. This is the only effort this University attempts in the way of medical teaching for the profession of the state. Each year distinguished and leading men in different departments of practice are brought to the city, who deliver the latest information in their special lines of work. This course differs from a medical meeting in that its purpose is distinctly to teach, each lecturer delivering a concerted course of addresses of an hour each, intended to emphasize and impress upon the listeners the scientific facts pertaining to the subjects being studied. The intention is to bring to the students of this course of lectures the opportunity of acquiring information which otherwise would necessitate a visit to distant centers of teaching. The instructors are well known men, entitled to marked consideration in their separate lines of practice, being all officially associated with centers of teaching. Dr. Judd of the Mayo Clinic, Dr. Addis of Stanford University, Dr. Brennemann of Northwestern University and Dr. Meyer of the University of California are men of national reputation. The mere mention of their names is sufficient to guarantee the quality of the lectures which they will deliver.

## THE STUDY OF GOITER

The modern emphasis on specialism is prominently portrayed in the existence of the American Association for the Study of Goiter. The goiter specialist is a product of recent years, the intensive study of diseases of the thyroid gland having been developed during the period of activity of those who at present devote their energies to this line of practice. Its prominence is demonstrated by the annual meeting of this organization to be held in Seattle July 10-11. Whether a practitioner be a surgeon or internist, a specialist or general practitioner, he is constantly dealing with thyroid diseases. Therefore, he will have an interest in the papers presented at this meeting. The program has already been published in this journal and freely distributed among the physicians of the Northwest.

# MEDICAL NOTES

## OREGON

Medical School Graduation. The Medical School of University of Oregon graduated forty-two students June 17, in connection with the University Commencement at Eugene, to whom the degree of doctor of medicine was awarded. Some of these graduates will enter practice while others will serve as internes at various hospitals.

New Clinic Building. Work has begun on the Clinic Building for the Medical School of University of Oregon in Portland. This will be a four story concrete structure, about 200 feet in length, connecting the Medical School with Multnomah County Hospital. It will provide an abundance of clinical material for teaching purposes. Its equipment and detailed arrangements will include everything for an up-to-date out-patient department.

Professional Building Under Construction. Erection of the proposed fourteen story Medical-Dental Building at Salem is expected to begin within a few weeks in order that the structure will be ready for occupancy early next year. The building will contain, besides offices for physicians and dentists, a modern surgery and a garage.

New Hospital to be Constructed. The Hood River Hospital Association has appointed an architect to draw plans and supervise construction of a new hospital. Bids will be called as soon as plans are completed.

Former Portlander Honored. Dr. William P. Murphy, a graduate of the University of Oregon Medical School, and his coworker Dr. George H. Minot of Boston, Mass., were recently awarded the Cameron prize for 1930. This honor is awarded annually by the University of Edinburgh for excellence in medical research. The basis of the award to Drs. Minot and Murphy was their epoch making discovery at the Peter Bent Brigham Hospital, Boston, of the use of liver in the treatment of pernicious anemia.

Conditions at Leper Colony Deplored. Dr. Robert Lindsey McArthur, who graduated from the University of Oregon Medical School in 1926 and later served an internship at the Seattle City Hospital, returned to Portland last month, following a period of three years spent as medical director of the Kalaupapa Leper Settlement at Molokai in the Hawaiian Islands. In a report handed together with his resignation to the territorial board of health, he brought charges of deplorable physical and moral conditions among the lepers, partly due, he alleged, to a noncooperative attitude on the part of the members of the board.

County Secretaries Meet. The first annual conference of secretaries of county societies of Oregon was held June 4 at the headquarters of the Oregon State Medical Society in Portland. Fifteen members attended. A dinner at the University Club, at which members of the Council of the Oregon State Medical Society were also present, concluded the meeting.

Clinic Free of Insurance Board Control. In a recent decision handed down by Mr. Claire A. Lee, state insurance commissioner at Salem, the Eugene Clinic was held to be free of any jurisdiction by the state insurance department. It was held that the clinic is not a hospital association, but merely a copartnership of physicians.

Police Surgeon Resigns. Dr. Leo Schatz has resigned his position of day surgeon at the police emergency hospital at Portland and has gone to New Haven, Conn. to engage in postgraduate medical work at Yale University. His place has been filled by Dr. Claude Bollam.

Central Willamette Valley Medical Society met at Lebanon May 31. Thirteen members attended. Dr. Albert W. Holman and Dr. W. E. Dudman, both of Portland, were guests of the society and delivered scientific papers.

Dr. H. A. Dowd, who has been engaged in practice at Gervais for the past five years, left last month for the East, where he expects to engage in postgraduate work in surgery. His place is being filled by Dr. A. B. Adkisson of Portland.

Physician Honored by Lodge. Dr. L. L. Baker of Eugene was elected grand master of the grand lodge of Odd Fellows at its recent annual session in Portland.

Health Officer Active at Ninety. Dr. Joseph Meyers, city health officer of Albany, recently celebrated his ninetieth birthday. He served with the Union army during the Civil War and was wounded in action.

Illegal Practitioner Fined. A fine of one hundred dollars was recently imposed in District Judge Mear's court at Portland on Anthony J. Corbett, formerly of the Dean Clinic. He was found guilty of prescribing medicine without a license last September.

Dr. F. W. Comings of Eugene has returned to his home, following an illness which attacked him suddenly at Ogden, Utah, while he was on his way to his former home in Vermont to spend the summer.

Dr. F. C. Brosius, who formerly practiced at Elgin, has returned to that place, following several years spent at Sandy, near Portland.

Dr. E. J. Jasper of Astoria was confined to a Portland hospital last month by a serious illness.

## WASHINGTON

Contract Practice Condemned. For several weeks a committee appointed by King County Medical Society has studied the subject of contract practice in Seattle and made several reports to the society relative to their labors. At the meeting, June 16, the following resolutions were adopted. (1) A member of King County Medical Society shall not work with a nonmember as an assistant employe if such nonmember engages in contract work. Penalty, suspension or expulsion. (2) The society condemns commercial solicitation as against public policy. Penalty, suspension or expulsion. (3) All service contracts must be filed with the secretary within thirty days after they are made. (4) A committee is to study the superclinic, with the purpose of keeping it from coming to Seattle.

New Superintendent Appointed. Dr. E. C. Ruge of Seattle has been appointed superintendent of the Northern State hospital at Sedro-Woolley. He has practiced for twenty years in Washington, including twelve years in Seattle. He succeeds Dr. J. W. Doughty, who has been superintendent of the institution for the past sixteen years, who was connected with the Western hospital at Steilacoom previous to this service.

Health Officer Resigns. Dr. Henry Storgaard, who has served as city and county health officer of Yakima county since 1925, tendered his resignation to Mayor Stratton May 19. He subsequently announced plans to engage in private practice and to open in the near future a new nonsectarian hospital. This is to be located in the former Clithero home on West Yakima Avenue and is to be known as the Yakima Surgery.

Walla Walla Medics Become Actors. Hidden talent was recently discovered among the Walla Walla physicians, when the "Womanless Wedding," a stage production, was presented at the Keylor Grand Opera House. Dr. C. R. Garrett proved himself a thoroughbred English butler, while Dr. Elmer Hill took the part of an aged devoted great-grandfather. Dr. John C. Lyman discarded his professional appearance and was such a true bad boy that his Dayton friends recognized him from childhood. Dr. Frank C. Robinson was in his true atmosphere as the "southern Kentucky colonel." The remaining cast was made up of local business men.

Isolation Hospital Planned. A committee from Aberdeen and Hoquiam have considered plans for a Grays Harbor county isolation hospital. A location has been suggested and plans for the hospital made by a committee from Grays Harbor Medical Society.

Doctor in Legislative Race. Dr. B. W. Braden of Three Tree Point, near Seattle, recently announced his candidacy for election to the State House of Representatives in the Forty-first District.

Flight Surgeon Appointed. Dr. John L. Walters of Spokane has been appointed flight surgeon and commanding officer of the 116th Medical Detachment of the 41st Division air service unit, Washington National Guard. He succeeds Dr. E. E. Langly, who has moved to California.

Private Hospital Completed. Dr. J. Fred Mills is now occupying his newly constructed private hospital and office building at Omak. The structure contains, besides rooms and wards for patients, a modern surgery and x-ray department.

Dr. E. L. Kimball, pioneer physician of Spokane, recently suffered a fractured hip and was confined to St. Luke's hospital.

Dr. Albert B. Murphy has been reelected president of the medical staff of Providence hospital in Everett.

Dr. M. M. Patton was recently chosen president of the staff of Sacred Heart hospital, Spokane.

Dr. S. A. Keim has returned to practice at Wenatchee after several months spent on the Coast.

## OBITUARIES

Dr. Bruce Elmore, Seattle, Wash., died May 28 at Providence Hospital in that city, following a prolonged illness, aged 54 years. During the Spanish-American War he served as quartermaster on the U. S. Hospital Ship "Crook" He was born at Liberty, N. Y., in 1876, received the Bachelor of Arts degree from Columbia University, New York, in 1899 and graduated from Columbia University College of Physicians and Surgeons in 1903. Following an internship at Roosevelt Hospital in that city he joined the United States Navy Medical Corps in 1905 and was stationed at the Naval Hospital at Washington, D. C. In 1911 he was commissioned in the Naval Reserve as lieutenant, Medical Corps. During the World War he established a naval recruiting office in Seattle. His practice in Seattle in his later years was confined mainly to industrial surgery. He was one of the original group of Seattle surgeons to become members of the American College of Surgeons.

Dr. William F. West, prominent physician of Everett, Wash., died at La Jolla, Calif., May 23, following a prolonged illness, aged 59 years. He was born in Greensburg, Ind., in 1871, and graduated from the Chicago Homeopathic Medical College in 1902. He located soon afterward in Everett and remained in active practice until several months ago, when he was forced by ill health to retire. He was prominent in medical and civic affairs, and had served as president of the Washington State Medical Association and of the Snohomish County Medical Society. He is survived by a son, Dr. W. F. West of Everett, and a brother, Dr. E. S. West of Yakima.

**Dr. L. F. Griffith**, Salem, Ore., died June 14 after an illness of four months, aged 62. He was born at Griffith Farm, Oregon in 1868. He attended the public schools in Salem and Willamette University. He graduated from the medical department of Vanderbilt University, Nashville, Tenn., in 1890. After serving an internship in Nashville City hospital he became assistant superintendent at the Oregon State hospital, Salem, in 1891. He served continuously in that capacity for thirty-nine years, with the exception of the year 1919 when he acted as superintendent of the institution. For a number of years he was a professor in the Willamette University School of Medicine in gynecology and obstetrics, also materia medica and therapeutics as well as instructor in nervous and mental diseases. For several years he had been professor in psychiatry at the University of Oregon.

**Dr. C. V. Herdliska**, Portland, Ore., died at the Salem General hospital June 2, aged 61 years. He was born at Elizabethtown, Ky., in 1867. He graduated from the Miami Medical College in Florida and the University of Prague, Austria. He practiced medicine in Kentucky and in Washington, D. C. In 1901 he was appointed by President McKinley as secretary of the U. S. Embassy at Vienna. President Roosevelt appointed him Consul to Panama, later serving in the same capacity in Peru. In 1918 he was appointed assistant surgeon of the Veterans' division of the United States Public Health Service. In 1922 he moved to Portland.

**Dr. Marshall Kennedy Hall**, Portland, Ore., died May 16, following a brief illness, aged 60 years. He was born at Huntingdon, Quebec, in 1870, and graduated from McGill University Faculty of Medicine, Montreal, Quebec, in 1893. He came to Oregon and after practicing for a short time in Rainier and La Grande, he moved to Portland, where he became assistant chief surgeon of the O. W. R. & N. Railroad. During the World War he was attached to the Army medical corps at Fort Lewis, Wash., and at Letterman hospital, San Francisco, Calif.

**Dr. Willis Henry Hall**, Seattle, Wash., died suddenly while visiting a patient May 26, aged 59 years. He was born at Lawn Ridge, Ill., in 1871, and graduated from the College of Physicians and Surgeons, Kansas City, Kan., in 1898. After practicing for a few years at Topeka and at Winfield, Kan., he moved to Seattle in 1907. At first he was connected with the United States Public Health Service, later he resigned this position to engage in private practice. During the World War he served with the Army Medical Corps at Camp Greenleaf, Ga.

**Dr. T. C. Humphrey**, Portland, Ore., died at his home June 2 from complications following injuries received in an automobile accident last November. He was 80 years old, being born in 1850 at Lockridge, Ia. He was brought to Oregon during his childhood and graduated from the medical department of Willamette University in 1886. After practicing for four years at Camas, Wash., he returned to Portland, where he was active until the time of his injury last year.

**Dr. Eugene Fuller**, retired New York urologist, died at his home in Seattle, Wash., June 4, aged 72 years. He was born in 1858, and graduated from Harvard University Medical School, Boston, Mass., in 1884. He engaged in the practice of urology in New York City and became a leader in that field, at one time serving as president of the American Urological Association. He retired from active practice ten years ago and moved to Seattle.

**Dr. Herman A. Greiner**, prominent North End physician of Seattle, Wash., died at his home May 21, following an extended illness, aged 52 years. He was born in Saugatuck, Mich., in 1878, and graduated from the General Medical College, Chicago, Ill., in 1904. He settled in Seattle in 1904 and built a large suburban practice there.

**Dr. Thomas Parker Butler**, pioneer physician of the Ballard district in Seattle, Wash., died at his home May 25, following a long illness, aged 74 years. He was born in 1856, and graduated from the Kentucky School of Medicine, Louisville, Ky., in 1882.

**Dr. Craig J. Baugh**, Pocatello, Ida., died suddenly at Limon, Mont., May 28, aged 62 years. He was born at Bonnsville, Mo., in 1868, and graduated from Barnes Medical College, St. Louis, Mo., in 1893. He had practiced at Pocatello since 1917.

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# REPORTS OF SOCIETY MEETINGS

## OREGON

### EASTERN OREGON MEDICAL SOCIETY

Pres., Charles Palmer; Secty., Lewa Wilkes

A meeting of Eastern Oregon Medical Society was held at Pendleton June 2. The following doctors from Walla Walla attended as guests of the Pendleton physicians: J. T. Rooks, A. E. Lange, C. J. Johannesson, J. C. Lyman, J. W. Ingram and Elmer Hill. After dinner at the Pendleton hotel a meeting was held in the office of Dr. J. P. Brennan.

Dr. J. T. Rooks delivered an address on "Septic Meningitis Complicating Middle Ear Infection." He described two cases recently treated by the injection of a small amount of spinal fluid into the muscles as well as the veins of each, which ended in recovery. The case was illustrated by charts and lantern slides.

Dr. A. E. Lange gave an address on "Epidemic Cerebrospinal Meningitis." This was based on personal experience in treating more than twenty cases in Walla Walla and Dayton. Special emphasis was laid on diagnosis, the importance of spinal puncture and the early study of the spinal fluid. The address was illustrated by lantern slides and charts.

**Dr. J. C. Johanneson** of Walla Walla addressed the Kiwanis Club of Dayton, June 4, on the subject, "History and Development of X-rays and Their Value to Modern Medicine and Surgery."

## WASHINGTON

### PIERCE COUNTY MEDICAL SOCIETY

Pres., D. M. Dayton; Secty., W. B. Penney

The regular meeting of the Pierce County Medical Society was held in the Parish Hall of the Episcopal Church, Puyallup, May 27. This was a dinner for members of the society and their wives.

Several talks were made by members of the society, notably Dr. J. F. Griggs and President Engels.

Attorney Robert E. Evans gave an address on "Expert Testimony." This gave valuable information as to what the lawyer considers good and bad testimony.

Dr. Engels then turned the gavel over to Dr. D. M. Dayton, who assumed his position as President for the ensuing year. Motion was made and unanimously carried thanking the ladies of the Episcopal Church for their hospitality and dinner. There being no further business, the meeting was adjourned until next fall.

## SPOKANE COUNTY MEDICAL SOCIETY

Pres., C. B. Ward; Secty., R. P. De Riemer

A special meeting of Spokane County Medical Society was held in the Paulsen Medical and Dental Building Auditorium, Spokane, June 6. Dr. W. J. Pennock occupied the chair in place of Dr. C. B. Ward. He spoke of the coming Idaho State Meeting at Coeur d'Alene.

Drs. A. Betts and G. Harbison were unanimously elected as delegates and Drs. A. A. Matthews and E. S. Jennings as alternates to the annual meeting of Washington State Medical Association to be held at Bellingham in September.

### PROGRAM

"The Role of Blood and Lymph Vessels in Pulmonary Tuberculosis," by Dr. W. S. Miller of the University of Wisconsin. The speaker was introduced by Dr. F. Fischer. He presented a life's work in the microscopic anatomy, physiology and pathology of the lung. The microphotographs and models from microscopic pathology were excellently illustrated. This work is fascinating in the extreme and has brought to the medical profession an insight into the role of the lymph, blood parenchyma in physiology of the lung and more especially in pulmonary tuberculosis.

## TRI-COUNTY MEDICAL SOCIETY

The Tri-County organization of Snohomish, Whatcom and Skagit counties held its annual meeting at the Skagit Country Club, Mt. Vernon, June 13. The program included a golf match, which was won by the Snohomish representatives.

After the dinner a scientific program was presented, including papers by Drs. Clarence Kjos of Mount Vernon and N. L. Thompson of Everett. Discussions were lead by Drs. S. S. Howe and O. E. Beebe of Bellingham. Dr. Llewellyn Cook of Anacortes had charge of the program, while Dr. George Crabtree of Mt. Vernon supervised the golf match.

## WASHINGTON TUBERCULOSIS ASSOCIATION

Washington Tuberculosis Association held its annual meeting in Tacoma June 12-14. Mrs. C. E. Mallette of Spokane, president of the Association presided.

During the three days session a program covering various phases of tuberculosis work was presented. One dealt with the "Hospitalization of the Tuberculous Indian," which has a distinct bearing on the tuberculosis program in the state, interest in which has been greatly stimulated by the establishment of Indian sanatoria at Toppenish for adult cases and at the former Cushman Hospital near Tacoma for children.

The early diagnosis campaigns of the past three years, sponsored by the National Tuberculosis Association, prompted a symposium on "Protecting Children from Tuberculosis," which was presented from the standpoint of newer knowledge of the avenues of infection and the methods of prevention. The program of Child Health Education, being directed by the Association and developed by a majority of the county tuberculosis leagues, was the inspiration for an outstanding presentation of the various approaches to this subject by the field workers engaged in the project. A session on the sale of Christmas seals, funds from which finance the programs of the volunteer work of the county, state and national organizations, was of much interest. There were luncheons each day and two evening meetings, all of which were well attended.

A feature of the convention was the celebration by Pierce County Tuberculosis League of the twentieth anniversary of its organization. This was the first league formed by the Washington Tuberculosis Association, when the active campaign of organization and education was launched in 1910. During the past twenty years the Association has formed similar leagues in thirty-four of the thirty-nine counties of the state.

Interesting accounts of the Pierce County League's early history and struggles to finance the educational program and to secure a sanatorium were given by those who actively participated at that time. The convention closed with a drive to Mountain View Sanatorium, where the delegates were welcomed and tangible evidence of the success of the league's efforts were shown them. The many graduate patients who had assembled for their annual home-coming was an added inspiration and proved the value of institutional care and educational work.

Men and women prominent in the tuberculosis campaign throughout the state were present, thirty counties being represented by one delegate or more. The attendance was the largest in the history of the Association. The convention was honored by the presence of four past presidents, Dr. Clarence A. Smith, Seattle, first president of the Association (1906-1910); Dr. C. Quevli, Tacoma, (1910-1919); J. V. A. Smith, Seattle, (1919-1921); and Mrs. R. C. McCredie, Sunnyside, (1921-25). Professor H. S. Brode of Walla Walla, who served from 1925 to 1929, was unable to attend.

The following were reelected as officers of the Washington Tuberculosis Association for the coming year: Mrs. C. E. Mallette, Spokane, president; Mrs. R. C. McCredie, Sunnyside, and Dr. C. Quevli, Tacoma, vice-presidents; Professor John Weinzirl, Seattle, secretary, and Chas. R. Case, Seattle, treasurer. J. V. A. Smith, Seattle, and Mrs. Bethesda Beals Buchanan, Executive Secretary are members of the Executive Committee.

EPIDEMIC "NIGHT BLINDNESS." Adults appear to require less vitamin A than the growing child, but it is essential that vitamin A should be present in the diet of the adult as a preventive of xeropthalmia and other troubles, especially lung diseases, due to a low resistance to infection. There is a form of "night blindness" which has been observed, often in an epidemic form, among older children and adults upon deficient diets. This trouble can be cured within twelve to twenty-four hours by cod liver oil. It is also cured by eggs, carrots and other foods rich in vitamin A. "Night blindness" is apparently merely an early stage of xerophthalmia before the cornea is very obviously affected.—Plimmer, R. H. A., and Plimmer, Violet G.: Food, Health, Vitamins, New York, Longmans, Green & Co., 1929, p. 53.

# BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

THE CLINICAL EXAMINATION OF THE NERVOUS SYSTEM. By G. H. Monrad-Krohn, M. D., F.R.C.P. Professor of Medicine in The Royal Frederick University, Oslo, etc. Fifth Edition, 222 pp. $3.50. Paul B. Hoeber, Inc., New York, 1930.

Throughout the book the author emphasizes the necessity for a routine method of examination of the nervous system. He takes up in order the importance of the anamnesis, the status presens, and then routinely the examination of the cranial nerves; the motor system under which are considered associated movements, coordination and cerebellar signs; the sensory system with its subdivisions, superficial sensation, deep sensation and combined sensation, together with illustrations of the sensory paths and segmentation. Next is considered the various reflexes and their interpretation, trophic and vasomotor state, the examination of the standing position and the evaluation of the different types of gaits and their diagnostic significance.

The remarks on simulation are interesting in that the comments and tests are very practical. The information concerning the spinal fluid is the same as that found in the average good text book on neurology.

The outstanding features in the Appendix are the comments and brief outlines of the Binet-Simon tests. It is interesting to note that in all the recent texts on the nervous system these tests are receiving more and more space. This indicates the dawning of an appreciation on the part of the modern medical man of what educational psychology has contributed toward a study of the individual in his entirety, and the foreword wisely suggests to all who intend to make their special study disorders of the nervous system, whether it be neurology or psychiatry, that they should have a foundation knowledge of neurology, psychology and psychiatry. To this should be added a knowledge of sociology. Other important items are the remarks on ventriculography and encephalography. In regard to the former the author sounds the warning note that the method is not without danger (from some clinics quite an appreciable mortality is reported), and it should, therefore, not be used as a routine method, and should only be carried out by someone who has sufficient experience in cerebral surgery to cope with the dangers that may arise.

Throughout the volume there is conciseness in the statements without sacrificing important details, and the illustractions are instructive which should serve as a valuable aid to those who wish to be informed about the nervous system as far as that is possible from textbooks on the subject.

ROHWER.

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THE BASIS OF EPILEPSY. By Edward A. Tracy, M.D., Director of Epileptic Clinic at Forsyth Dental Infirmary, Boston. Illustrated. 92 pp. The Gorham Press, Boston, 1930

The author describes again the skin reflexes due to vasoconstriction. He elaborates on the various skin reflex tests with illustrated articles and photographs of actual tests. He claims that "the chronic vasoconstriction spots with heir intensifying and fading while under observation demonstrate a diseased condition of the sympathetic neurons nvolved in their production. The many abnormalities of he reaction-times show, likewise, a diseased condition of the sympathetic neurons, for the reaction-time depends upon these neurons." This is an interesting observation. Everyone who checks carefully on epilepsies will find these skin reflexes to be uniformly present. They do not always occur in brunettes but always are found in blondes.

In the second section the author undertakes to make a diagnosis of epilepsy before seizures have occurred, based largely on the history of headache, dizziness, fainting, sudden pallor, loss of consciousness, nausea, trembling, weakness or a convulsion. When such a case presents itself he then tests for the observative findings, such as (1) unbalancement of the vasomotor reflexes, (2) hypertonia of sympathetic fibres (manifested by the reaction-time being less than normal, or by the intensity in whiteness of the reflex), (3) a patchy vasoconstriction reflex, or an absence of the reflex (perhaps due to degeneration of sympathetic fibres, a condition found by Echeverria in his autopsies upon epileptics as described later), (4) a diffuse vasoconstriction reflex in place of the normal white streak, and (5) chronic vasoconstriction spots. In these cases epilepsy in its incipient stage is diagnosed, and he presents case histories to prove his point. Vasomotor disturbances and disturbances of the sympathetic nervous system, resulting in a sympathetic hypertonia, the author believes to be at least present in all cases of epilepsy.

The third section is an elaboration of the reflex test and is beautifully illustrated by actual photographs. He concludes by giving a summary of his belief that epilepsy is a disease entity. He quotes Echeverria who found changes in the sympathetic ganglia at autopsies on five epileptics and believes this is a positive confirmation of his own belief that the hypertonia of the sympathetic nervous system, with associated skin reflexes, has a logical basis in this fact. The author does not claim a cure for epilepsy but believes that in incipient cases proper use of diet and administration of colloidal oenanthe can hold the symptoms in check. Calcium lactate and parathyroid tablets are also used in these cases. All abnormal conditions are corrected in a general way. Colloidal oenanthe, a drug, is used because it has a depressing effect on hypertonia and the sympathetic nervous system.

As pointed out by the author, other conditions beside epilepsy can produce the vasomotor skin reflexes. It is difficult to believe that all epilepsies apparently are based upon a diseased condition of the sympathetic nervous system, and yet the chronic constipation associated in many epileptics, the vasomotor disturbances which are very evident are so commonly met with that one must conclude that in these diseased conditions the epileptic seizures are not a mere incident. The author has made a very important contribution to this subject and one which all observers must consider seriously when making their examinations. The book is well bound, easy to read and beautifully illustrated.

SWIFT.

---

INFANT NUTRITION. A Textbook of Infant Feeding for Students and Practitioners of Medicine. By Williams McKim Marriott, B.S., M.D., Professor of Pediatrics, Washington University School of Medicine, St. Louis, etc. Illustrated. 375 pp. $5.50. The C. V. Mosby Company, St. Louis, 1930.

A textbook on infant feeding by this author has long been awaited by pediatricians, for this clinical investigator is perhaps best known for his enlightening interpretations of nutritional problems in terms of fundamental biochemistry. The first chapters are devoted to a consideration of growth and development, energy metabolism and the characteristics of the individual metabolites. Especially enlightening is his explanation of the advantages and disadvantages of the many forms of carbohydrate used in modifying artificial feeding mixtures. In the section on vitamins he deplores the modern tendency to substitute entirely for cod liver oil the more recently discovered antirachitic agent, irradiated ergosterol (viosterol). The latter contains only the rickets-preventing vitamin D and is quite lacking in vitamin A, a substance found in abundance in cod liver oil, and which, he believes, it quite as necessary as the D factor in promoting the proper development of infants.

There are other chapters devoted to breast feeding, simple milk and carbohydrate formulas, evaporated milk, the various forms of acidified milk, and to the special processed and "reconstructed" feeding mixtures. The subjects of anhydremia, acidosis and alkalosis are presented. This book is written in a clear and simple style and without doubt is the most important American text on infant feeding that has been published in the past ten years.

OLMSTED.

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MRS. EDDY. The Biography of a Virginal Mind. By Edwin Franded Dakin. 553 pp. $5.00. Charles Scribner's Sons, New York and London, 1929.

This biographical sketch outlines the life and character of one of the most remarkable women of the century. Born and reared in poverty, with limited education, she attained fame and wealth at an age when most people have retired from active life to enjoy years of leisure. The author describes in detail how this woman obtained the information and inspiration from Quimby for the foundation of the cult that developed into the religious sect which she named Christian Science, together with the system of treating disease which had previously been practiced by her instructor and teacher. This history reveals the developments this remarkable woman perfected through a long life of persistent and domineering personality. The author demonstrates the upbuilding of an association of religion, suggestive mental therapeutics for treating disease, combined with an extensive commercial institution, expanding into an enterprise involving millions of dollars.

The medical profession is not concerned with the religious features of Christian Science any more than with those of other sects, but its relations with diseases of the human system and their treatment has brought it into immediate contact with medical practice. Throughout this book are portrayed the stigmata of paranoia, displayed so prominently during Mrs. Eddy's long life. Her delusions were most conspicuous, from belief in her ability to cure incurable diseases to the assurance of her own attributes of deity, although the latter were somewhat modified in her later years. Delusions of persecution were among her constant and daily convictions. Her continual reiteration concerning "malicious animal magnetism" influencing and controlling her actions, emanating from the minds of intimate associates who later were characterized as bitter enemies, were among the outstanding features of her character. The fact that in spite of these manifest abnormalities she was able to build up this great religio-medical organization is proof of her dominating personality and the inborn qualities of leadership which she possessed.

This history is a fascinating revelation of the growth and expansion of the church and system of treating disease, of which she was the commanding and imperial leader. Her word was law, whether applied to the conduct of the church or the method of treating human ailments. To the physician many of the medical aspects which are here portrayed have both their grotesque and tragic aspects. That any person ignorant of the human system and its pathology, and blissfully denying their existence, should seriously undertake the treatment of well known and established forms of illness seems most extraordinary, although such procedures have become commonplace since Mrs. Eddy first practiced and taught others her methods. While the author expatiates on the various weaknesses and inconsistencies of Mrs. Eddy's personality, he pays tribute to her genius as portrayed in the development of her church, the devotion of a host of followers who were faithful and constant adherents during her life and persistently have revered her memory and the work which she accomplished. Every physician comes in contact to greater or less extent with Christian Science and its relation to human illness through treatment by the practitioners of this cult. This book is worthy of reading by anyone who seeks intimate information concerning its foundation and development under the guidance and leadership of Mrs. Eddy. ———

DISEASES OF THE NOSE, THROAT AND EAR. By William Lincoln Ballenger, M.D., F.A.C.S. Late Professor of Otology, Rhinology and Laryngology, College of Medicine, University of Illinois, Chicago, etc. Revised by Howard Charles Ballenger, M.D., F.A.C.S., Associate of the Otho S. A. Sprague Memorial Institute Laboratory of the Children's Memorial Hospital, Chicago. Sixth Edition, Thoroughly Revised. Illustrated with 583 Engravings and 29 Plates. Cloth, 1138 pp. $11.00. Lea & Febiger, Philadelphia, 1930.

This is the justly popular Ballenger text, brought up to date by the rewriting of some old chapters and the addition of some new ones. Additions to the section on the larynx have been made by Chevalier Jackson and Gabriel Tucker, who have written also the section on bronchoscopy. Jackson wrote the chapters on esophagoscopy and gastroscopy, Tucker those on the bronchoscopic clinic, direct laryngoscopy and tracheobronchoscopy. In the section on the ear, Lewy has written the chapters concerned with the physiology and functional tests of the labyrinth, and labyrinth operations.

The editor has added descriptions of the audiometer, magnesium tuning forks and simulated deafness. He states, "every page (of the old edition) has been subjected to a careful scrutiny with additions, omissions and rearrangements." The new edition gives abundant evidence of the truth of this statement. The subjects are brought up to date, the illustrations are ample and clear, the text is comprehensive and concise. This book, edited by two generations of this famous professional family, should be a matter of pride to all American oto-laryngologists. It can heartily be recommended, both to the beginner and to the practitioner of this specialty.

HARTER.

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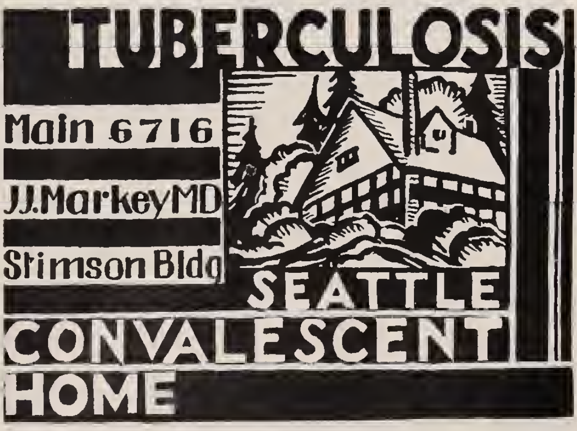

Surgical Diagnosis. By 42 American Authors. Edited by Evarts A. Graham, M. D., Professor of Surgery, Washington University Medical School, St. Louis. Three Quarto Volumes, totaling 2750 pages, containing 1250 illustrations, and separate index volume. Philadelphia and London; W. B. Saunders Co., 1930. Cloth $35.00 a set. Volume III and separate index.

The first two volumes of this set were reviewed in April. The third volume deals with diseases of the chest, biliary passages, genitourinary and neurologic systems. The standard of excellence noted in the first two volumes is well maintained, the chapter on diseases of the liver and biliary passages by Graham being especially valuable, coming from the pen of such an authority. This volume completes a system which is strictly modern in its scope and treatment of surgical diagnosis. Every surgeon will find invaluable assistance in these three volumes for his professional work. They are commended to all engaged in this form of practice.

A separate volume of 155 pages comprises a general index for the three volumes. Forbes.

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Modern Methods of Treatment. By Logan Clendening, M. D., Professor of Clinical Medicine, Lecturer on Therapeutics, Medical Department of the University of Kansas. Third Edition. 815 pp. $10.00. The C. V. Mosby Company, St. Louis. 1929.

The author states that this book is intended to furnish an outline of all methods of treatment in internal medicine. It does not, therefore, give a complete description of a given disease with all its complications but offers useful suggestions. It presents a well balanced account of diet, drugs, hydrotherapy, blood transfusion, psychotherapy and other subjects. Part I describes the methods used in treatment, while Part II deals with the application of therapeutics to particular diseases, such as infectious diseases, those of metabolism, the blood, the cardiovascular and respiratory systems, the kidney, digestive system and ductless glands. Chapters on each of these subjects discuss the various diseases grouped under these headings. As a book for ready reference, one can from it obtain useful suggestions without the necessity of reading extensive descriptions of each.

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A Manual of Diseases of the Nose and Throat. By Cornelius G. Coakley, A.M., M.D., F.A.C.S. Professor of Laryngology and Otology in the College of Physicians and Surgeons, Columbia University, New York, etc. Seventh Edition, Revised and Enlarged. Illustrated with 153 Engravings and 7 Colored Plates. 672 pp. $4.50. Lea & Febiger, Philadelphia, 1930.

As the author states in the preface, this volume is intended to offer a compact manual for the student and practitioner. The first four chapters deal concisely in sequence with anatomy, physiology, technic of examination and antisepsis in operations. Then follow in natural order, beginning with the vestibule of the nose and ending at the larynx, chapters covering the etiology, pathology, symptoms, treatment, etc. of the structures found in this field.

Without wishing to detract from an old reliable authority, it must be said that many experienced operators would differ sharply with the author on his views as to the best procedure in the surgical care of the chronic infections of the sinuses. But even presuming grounds for this criticism, it is but a minor matter in a work of this character. The last chapter, under the heading therapeutics, offers many useful formulae and suggestions. The book can be highly commended to anyone looking for a concise and worthy presentation of a big subject.

Cunningham.

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Modern Otology. By Joseph Clarence Keeler, M.D., F.A.C.S., Associate Professor of Otology, Jefferson Medical College, Philadelphia, etc. Ninety original illustrations and 15 colored plates. 858 pp. $10.00. F. A. Davis Co., Philadelphia, 1930.

This is a very complete book, in which every step is clearly and concisely explained and nicely illustrated. Of special interest are the chapters on diseases and treatment of the tympanic membrane, eustachian tube and Meniere's disease, otology in children, the medicolegal aspects of ear work, the ears as a focus of infection, the endocrine factor in otosclerosis, the use of audiometers and all later aids in hearing devices and methods. The author has had twenty-five years experience in teaching and practical work, during which time he has performed more than twelve hundred mastoid operations. Weber.

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Obstetrics for Nurses. By Charles B. Reed, M.D., F.A.C.S. Professor of Obstetrics, Northwestern University Medical School, etc., and Charlotte L. Gregory, R.N., B.S., M.D., Adjunct in Obstetrics at Wesley Memorial Hospital, Chicago, etc. One Hundred Forty-four Illustrations Including Two Colored Plates. 399 pp. $3.00. The C. V. Mosby Company, St. Louis, 1930.

The special purpose of this volume is as a textbook for student nurses. Debatable matters are omitted, but essentials pertaining to obstetrics and care of patients are included. Normal and abnormal pregnancies are discussed. After considering the mechanism of the normal labor and puerperium, complications and abnormal sequelae are presented. Attention is paid to the care of the child and infant feeding. There is a wealth of illustrations which amplify the text.

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Diseases of the Urinary Tract in Children. By Edwin Beer, M.D., and Abraham Hyman, M. D. With 50 illustrations. 318 pp. $6.00. Paul B. Hoeber, Inc., New York, 1930.

This book is very well written so that it can be read and understood not only by the urologist but by any physician. One will find a comprehensive review of urology found in children, with the procedures used at Mt. Sinai Hospital for diagnosis. As a whole the general practitioners and pediatricians are skeptical of a urologic examination of the infant. If they would read this work it would dispel some of their anxiety as to this procedure.

Ridlon.

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The Medical Clinics of North America. (Issued serially, one number every other month.) Volume 13, Number 6. (Mayo Clinic Number, May, 1930.) Octavo of 273 pages with 43 illustrations. Per Clinic Year, July, 1929, to May, 1930. Paper, $12.00; Cloth, $16.00 net. W. B. Saunders Company, Philadelphia and London, 1930.

This volume presents clinics on many interesting topics. Different phases of goiter in different aspects are presented by well known men from the Mayo Clinic. Cases illustrating several forms of jaundice are presented, with discussions of their types and complications. Clinical reports appear on several phases of arthritis, among them being an interesting case of ganglionectomy and ramisectomy by Mayo, Adson and Rowntree. Other reports deal with diseases of the rectum and colon, encephalitis and diabetes.

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# ADDRESS

## FINANCES OF OUR STATE ASSOCIATION*

H. D. Spencer, M.D.
IDAHO FALLS, IDA.

Those of you who have been affiliated with the Idaho State Medical Association since its begining are thoroughly familiar with its workings, its plans and its problems. Each one present understands clearly that every member of our profession must attack the double task of routine duties and of training the community in its attitude toward our work. The profession cannot fulfill its mission in the world unless it can find and keep active the way of extending its influence beyond the immediate routine ministrations which are its first and most obvious duties.

We must ask ourselves just how well our members, as individuals, are equipped to become agents of society for the discharge of this double duty. How many of you individual doctors present are able to meet all situations arising from your practice with your limited personal armamentarium, without any help from the professional organization? I frankly admit that I am not one of them. Through the cooperative investigations of our Association many devices have been perfected and results achieved which no isolated and individual doctor could reach. What I am trying to say is that the profession as a whole must aid the individual with devices which will make him more effective than he would be, if operating in a purely personal way.

When in 1927 our constitution and by-laws were amended, giving the house of delegates authority to increase the state dues, the first great step in professional aid from the Association to the individual member was taken. The next step was the assumption of the work carried on by the Public Health League which had rendered us such useful and satisfactory service during its existence. The work of our councillors must not be overlooked and cannot be overpraised. A study of the by-laws shows that many important duties are given them which they have always well and faithfully performed. In addition they have frequently carried a large amount of work not specifically provided for by our constitution and by-laws but of tremendous importance to the welfare of the members.

So many questions and problems arose which demanded immediate attention that there developed a keenly felt need for some sort of permanent official in the capital city. So with some fear and trepidation and without much money a layman manager, in the person of the capable Mr. Paul Davis, was placed in charge of a central office at Boise. This office has intelligently endeavored to carry on work as outlined by the councillors of our Association. To me it is perfectly evident from a study of the reports of the activities and accomplishments of this office, that, with increased financial support and perhaps a larger staff, these headquarters may develop new projects along lines which have not yet been touched or even recognized.

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* President's Address read before the Thirty-eighth Annual Meeting of Idaho State Medical Association, Coeur d'Alene, Ida., June 27-28, 1930.

This point of financial support is the one I wish to discuss. There seems to be some little discontent among some of the members about the amount of our state dues. Personally I feel that those who share this discontent have not given sufficient thought to the value received in return. At first glance $40 or $50 dues per year may sound exorbitant, but if one only stops and considers the purpose and results, it will seem a mere pittance. To have invested in the preparation for your chosen life's work all that must be expended by a doctor, and then be careless and indifferent about putting back into it an amount sufficient to safeguard it from professional impoverishment, is preposterous.

Have you ever compared your Association dues with those of fraternal and social orders to which you belong? None of us here, I venture, but belongs to from one to several such orders. When I totaled the amount I was spending on dues for such memberships and compared that with what I was spending on dues for my professional Association, I was astonished to find that the latter was, by way of this comparison, fairly inconsequential. We would not for a minute entertain the idea of discontinuing our affiliation with these worthy societies just for the purpose of saving the money spent on their dues. Yet how much more important to us and to the public we serve that we support in a financial way our professional state organization.

The intangible nature of these returns may make it a trifle difficult for us to recognize them and get them over on the side of the ledger with the assets instead of with the liabilities. We must consider our councillors as any business concern would its board of directors. We elect them to serve in exactly the same capacity to our Association as a corporation does its directors. No business concern expects its directors to devote any of their time to the detailed work of their office, and only as much of their time as is necessary to lay down and direct the policies of the company. The details of carrying out the work of the directors is put into the hands of a capable executive secretary with sufficient office force to satisfactorily execute the business, and the expenses are all met by the company. Unless we apply big business methods to the workings of our Association, we cannot expect to achieve like success. Our councillors are entirely too busy to devote any of their time to matters other than those concerning the planning and directing of the policies and aims of the Association, and if their plans and policies are to be carried out and the Association and its members to receive any benefits from them, they must have this office and official.

Another aid to them, I believe, would be to have a state secretary who resided in Boise. We have no fault whatever to find with our present secretary and recognize and appreciate the excellent and faithful service he has rendered our organization, and this suggestion is made merely from the viewpoint of simplifying the work of the council.

The maintenance of such an office is directly in keeping with the practices of all corporations and big business affairs. Not one of them is without its highly paid executive or general manager, whose business is solely that of looking after the affairs of the organization, collecting data, getting first hand information necessary to the welfare of the business, acting as a faithful watch between it and any dangerous or unfair competition and a thousand and one similar duties.

The executive in this office may materially aid his company by merely forming business friendships and contacts with heads of other companies. The company could probably not give a clearly specific outline of his duties but nevertheless they entertain, no doubt, that the expense of his services is well worth while and his office would be the last one to be thought of as not necessary. All big business concerns of the present time consider the office executive one of the first items of importance and they all employ highly efficient and a comparatively highly paid person acting as such. In case business becomes lax and financial expenditures need cutting somewhere, it is a peculiar circumstance that the elimination of the chief executive is never considered the proper means of making the financial adjustment. The operators of business concerns are well acquainted with the fact that this official is the one person who has at his finger tips all the ends of the business and whose guiding hand can keep them in the path of progress. If this is true in the business world, it must of necessity be true in the professional field.

The complex nature of our present day social order no longer affords us the group individualism of a few years ago. If we are to continue to grow in knowledge and usefulness, we must learn to cooperate with other groups of our own profession and those of the related professions. In order that our Association may function to its greatest limits, it must be financially able to develop and practice close interprofessional relationships with the medical organizations of other states and become national in its scope and influence.

The medical associations of other states find it profitable to expend considerable funds in the carrying out of their plans and purposes. A report from the treasurer of the Wisconsin Medical Association for 1928 shows a budget of $24,000 for a year. In taking note of the items of expenditure, we note such headings as salaries, rent, office, travel, press service and miscellaneous. One item of special interest was a $1500 reserve for the Committee of Public Policy, a committee corresponding to our Legislative Committee. Their total budget was three times ours.

This Legislative Committee of our organization has work of tremendous importance to do. The promotion of needed helpful and protective legislation is essential and to neglect to forestall malicious and harmful kinds would be absolutely suicidal to our Association and to our individual practices.

Let us turn for a few minutes to some of the actual work of our central office during the past few years and consider the facts of its usefulness to the organization as a whole and to the individual member. A brief scanning of its accomplishments reveals a list too long to give here in detail. Some of the more outstanding achievements include the defeat of the osteopath bill, securing legislation which defeated the quacks, protected the physicians from the Industrial Accident Commission's political effort against us, cut the red tape in securing small amounts in the Small Claims Court, and much other helpful legislation I shall not take time to mention. It has handled thousands of claims before the Idaho State Insurance Manager and Industrial Accident Board, protected doctors against the cancelling of licenses for failure to pay the $2.00 renewal fee without notification that it was due, settled a number of malpractice suits, has distributed myriads of pamphlets and fly sheets to people of the state, and perhaps the greatest act of all, has secured the cooperation of many newspapers in publishing articles pertaining to public health.

Our Association cannot afford to neglect its educational policy and work. Health is our most important individual and national asset. Viewed from every angle no more important subject could engage our attention. From the economic point of view health comes first, for sickness constitutes the heaviest charge of all upon industry and production of all sorts. Viewing health in its broadest aspects, viz., soundness of both body and mind, its importance as a factor in social welfare is very great. Our penal and charitable institutions are filled with mental and physical wrecks. Last, but not least, is the personal satisfaction and happiness that comes from good health.

These being the facts, it behooves us to employ every known agency for the prevention and control of disease. The knowledge we already possess, if intelligently and fully applied, would greatly reduce sickness and prolong human life. We cannot, however, progress any faster than we can educate the public and enlist the support of the average man in the promotion of good health. This knowledge of public education in matters pertaining to health in the State of Idaho is one of the important works of the Association, a work which I am sure neither the group nor the individuals wish to see discontinued. Through it the medical men have already received a fair degree of recognition and support from public spirited men and women. But we must keep pushing forward, we dare not stop.

This moving forward is by no means a simple matter. The public mind is not at all like that of the individual. It is not even the sum total of all minds of the community, nor yet the common average of those minds. There is often great difference between the general opinion of the community and that of certain prominent class or professional groups. There is also much difference between popular impression and true mature public opinion. Popular impression is shallow and fickle, easily stampeded by emotional appeals, by slogans and war-cries; it is notoriously ill-informed, warped by traditional attitudes and particularly susceptible to suggestion. Real public opinion is usually a matter of slow growth. The issues have to be thrashed and sifted out before opinion becomes organized.

Take, for instance, the matter of public opinion relative to the cost of a physician's education. We can never be benefitted by educating the public with the facts about that cost. It must be educated in its attitude toward it. Education is emancipation from herd-opinion, self-mastery, capacity for self-criticism, suspended judgment. It is a spiritual revelation of human life. The task of education is to place man above and not within the system of his beliefs and ideals.

Sooner or later truth is recognized and wins the day, but not until prejudices are scrapped and old unproven theories are put aside for demonstrated truths. The reason that so many cure-alls, so many quack remedies and cures of various kinds flourish today like the green bay tree, must be because the education has broken down somewhere.

The educational contribution which our medical profession is making to the citizens of our state, nation and the world toward the science of living is no small one. The whole desire of the normally minded is toward prevention and the only hope for prevention is education. As a state Association, we can never for one minute desist in our educational endeavors and we can carry them forward only by keeping our political contacts and legislative influence. To do this we must maintain our central office in Boise.

In view of all these facts I am sure that every one of you can see the necessity of keeping our present rate of dues at its present figure or that it may at some time be raised, but never lowered. When we consider how complicated is the work of the Association, owing to the mixing of the medical profession and the political machinery of the state, and the difficulties due to the great distances geographically and the smallness professionally, you can easily recognize the necessity of having sufficient finances for the working out of our program and problems.

I am firmly convinced that only by maintaining a central office at Boise with an executive secretary in charge of affairs can we adequately take care of the work and solve the many difficult and important problems of the Association and its individual members. Of course, our friend, Will Rogers, tells us that it is not taxes that is keeping us broke but dues, but we cannot take him any more seriously than he intended us to do. In reality, the amount of assessment necessary to satisfactorily carry on the work we have set before ourselves in comparison to other similar expenditures is trivial.

In view of all the facts herein brought to your attention I beg of you your wholehearted support both professionally and financially in the continuance of the program as has been mapped out in the past two years.

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Evaluation of Therapeutic Results in Essential Hypertension. In a series of forty unselected hypertensive patients, seriously and enthusiastically treated by David Ayman, Boston (*Journal A. M. A.*, July 26, 1930), by the daily administration of a few drops of dilute hydrochloric acid, the symptoms were definitely improved in thirty-three, or 82 per cent. Ayman finds that the symptoms associated with uncomplicated essential hypertension may frequently be relieved by the suggestion inherent in any seriously and enthusiastically prescribed drug or method of therapy.

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# ORIGINAL CONTRIBUTIONS

## PROPHYLACTIC GASTROSTOMY

### INDICATIONS, TECHNIC AND RESULTS IN FORTY-FOUR CASES *

E. P. Quain, M.D.
BISMARCK, N. D.

Postoperative vomiting is one of the disagreeable after-effects following many surgical interventions in the abdomen. It is ordinarily of short duration and without any other important bearing on the convalescence than the pain produced in the wound by the violent contractions of the abdominal muscles. In certain cases, however, the straining and vomiting may recur for two or three days, or longer, and they may give rise to serious concern both to the patient and to the surgeon. This is especially true when the operation has been of such a nature that vomiting and straining may jeopardize the success of the surgical treatment. Regurgitation of duodenal contents into the stomach sometimes continues for several days, even in the absence of definite mechanical obstruction to the normal gastrointestinal peristalsis. This is more likely to happen when there has been much handling and bruising of the abdominal viscera during the operation. It is more pronounced after surgical traumatization in the middle and upper segments of the abdomen than in the pelvic region.

The treatment commonly resorted to, when there is prolonged postoperative regurgitation of duodenal contents and vomiting, is gastric lavage. It may be necessary to pass the stomach tube several times in the course of the recovery. In certain severe and important cases the tube may be passed at stated intervals in order to deflate and evacuate the stomach and to prevent harmful distension.

The passing of the stomach tube is a very distressing procedure to the majority of human beings, even if it is done when there is no recent wound in the abdominal wall. Although the method is usually very effective, it has been known to provoke serious damage to the patient. The choking sensations produced by the stomach tube, and the retching and straining on the sutures after a laparotomy become so intolerable and distressing to some patients that these features are often spoken of as the most disagreeable and painful recollections of the operation.

The use of the duodenal tube is a more humane procedure, but in order to be effective it must be left in situ for hours at a time. Patients with irritable fauces and those with hypersensitive temperaments sometimes choose to have the quicker emptying of the stomach with the larger tube in preference to the slower, duodenal method.

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* Read before South Dakota State Medical Association, Sioux Falls, S. D., May 21, 1930.

Wounds heal most quickly and safely when they are in a condition of absolute rest. After gastric and intestinal resections or anastomoses there is never the perfect quiet and repose at the site of the operation that prevail when other parts of the body have been incised and sutured. Peristaltic movements and gas distension prevent the desired rest of the parts. Distension of hollow organs alternates with collapse as the fluids and gases pass and repass in the neighborhood of the visceral wound. Postoperative hemorrhage and even leakage have been caused by the constant commotion of the parts under discussion. The more peristalsis, regurgitation and vomiting the greater the disturbance to the gastric and intestinal wounds, and the greater the chance for these complications. It would be interesting, if we might know whether or not these factors have any causative influence on the formation of peptic ulcer after gastroenterostomy. This question will be mentioned again in this article.

Gastrostomy as a complementary or prophylactic procedure for the purpose of keeping the stomach constantly deflated and empty after operations for acute perforations of gastric and duodenal ulcers has been practiced as a routine, chiefly by Swedish surgeons, for many years. It has proved so useful in these emergencies that in certain desperate cases of gastric perforation, where it seemed unsafe to search for the perforation in order to close it, gastrostomy alone, and without any treatment whatsoever of the perforation itself, has saved the lives of some patients. Emptying the stomach and keeping it empty and collapsed stopped the leakage in these cases, while adhesions were forming to close the perforation.

With this knowledge at hand and being anxious to avoid the necessity of using the stomach tube with its attendant pain, mental upset and straining on the suture lines, gastrostomy has been performed by the surgeons of our clinic in combination with abdominal operations for a number of lesions other than perforated ulcers. The results have been so eminently pleasing, both to patients and to surgeons, that we no longer hesitate to apply this technic after any laparotomy, when we have reasons to believe that distension, regurgitation and emesis may become serious handicaps to the patient's safety and comfort during the convalescence.

The technic followed by us in making gastrostomy is very simple and much like that employed in making enterostomy for temporary intestinal drainage. At the completion of the main operation a place is chosen near the lowest point of the greater curvature, that is, ten to fifteen centimeters from the pylorus. After placing a chromic catgut or a linen puckering suture, a rubber tube is pushed into the stomach through a stab wound. A No. 24 catheter with its tip cut off is a suitable size in cases of elective operations. In emergency operations a larger tube should be used to prevent clogging from possible food particles and plugs of mucus, the latter being present especially in cases of acutely perforated ulcer.

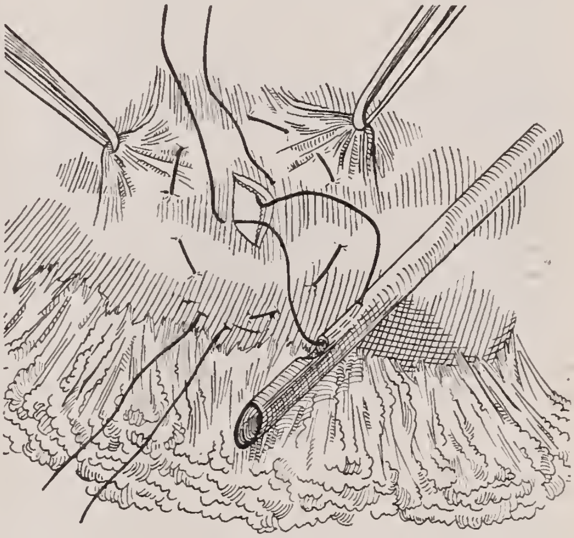

Fig. 1. Proper method of fastening gastrostomy tube to edge of stab wound.

A catgut suture, fastened about two centimeters from the end of the tube, is passed through the edge of the stab wound and tied as the tube is inserted. This is for the purpose of forming an inversion of the gastric wall around the tube. By pushing the tube gently into the stomach at the moment of tying the puckering suture, a funnel shaped depression is formed around the tube (figs. 1 and 2). After adhesions have formed, this funnel serves as a valve and prevents leakage when the tube is removed. A fold of fat from the nearby omentum is fastened around the tube for two or three centimeters (fig. 3). This keeps the stomach away from the abdominal wall and helps to obviate the formation of symptom-producing perigastric adhesions. By watching the natural position in which the stomach rests while the patient lies

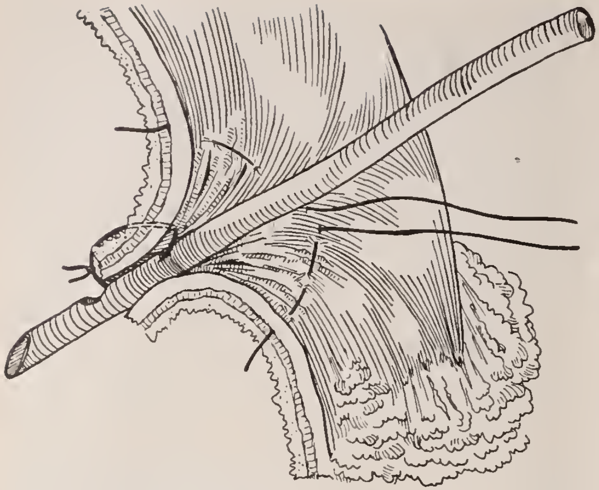

Fig. 2. Funnel formed by pushing tube into stomach while tying puckering suture.

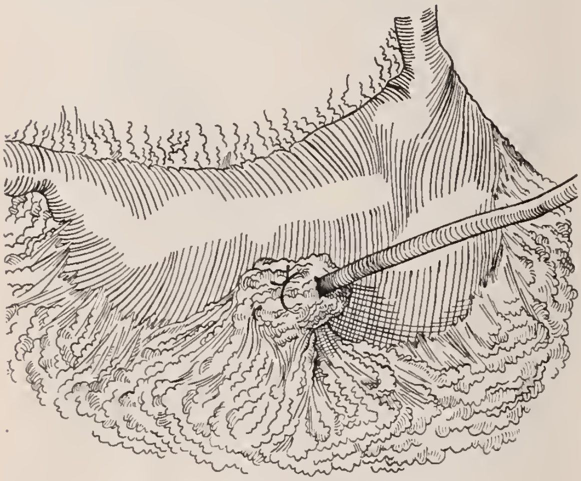

Fig. 3. Omentum folded around tube.

on the operating table, the tube is passed through a stab wound in the abdominal wall directly over the place of gastrostomy, usually a little to the left of the linea alba. It should not be placed in the operative wound. For the purpose of a steady fixation in the stab wound, a strip of gauze twisted and tied snugly around the tube will give less pain than a suture in the skin (fig. 4).

During the first two or three days after operation there will be an intermittent spurting of fluid from the tube, corresponding to the gastric contractions. Gas is heard bubbling almost constantly into the bottle which holds the end of the tube at the patient's side. It is often astonishing to note the amount and the frequency of the escaping gas. In cases of pronounced intestinal regurgitation green or brown liquids may escape through the tube for several days before normal peristalsis is reestablished.

The tube is clamped as soon as normal peristalsis has become reestablished. It will be necessary to loosen the clamp from time to time at first to allow an excess of gas or fluid to escape. The patient will promptly inform the nurse, if the pyloric emptying should be too slow. He has learned that the sensation of nausea or of fulness and discomfort in the stomach passes away immediately when the tube is opened.

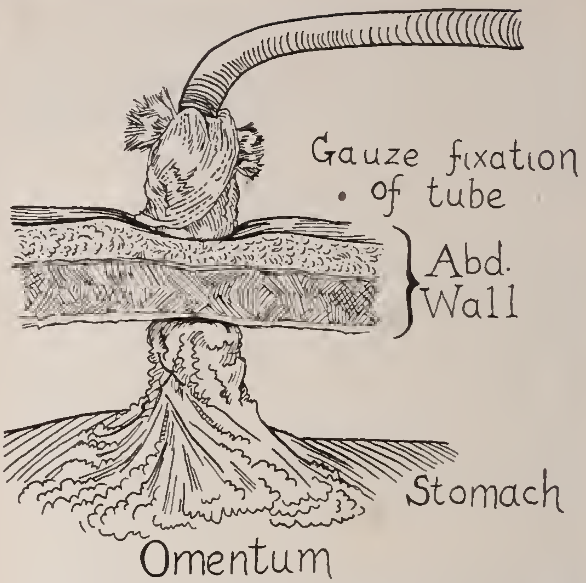

Fig. 4. Fat prevents gastric adhesions to abdominal wall; tube fixed in abdominal stab wound by gauze tie.

If the tube has been properly fastened in the gastric stab wound, it should be left in situ undisturbed until it is entirely loose and ready to drop out. This usually takes place in from eight to twelve days. Careless pulling on the tube before it is free in the sinus is likely to evert the funnel and produce a temporary leakage of gastric juice. We have seen no leakage since the technic just described has been followed. However, if some leakage should occur after removing the tube, it is of no serious consequence for it will stop in two or three days. Moreover, gastric juice is much less irritating to the skin than is the secretion which sometimes follows the removal of the enterostomy tube from an intestinal fistula.

These patients are very comfortable after operation. Epigastric distension and emesis are absent and nausea is rare. Gas and regurgitated duodenal fluids escape through the tube, and gastric lavage is encouraged by allowing the patient to drink all the water he desires. Since but little water is absorbed from the stomach, and especially so while regurgitation is present, it is necessary to give fluids freely, subcutaneously and by proctoclysis, to avoid harmful desiccation of the tissues of the body.

The nonuse of the stomach tube is an outstanding benefit from the viewpoint of the patient. The best testimonials on this point have come from some patients who have had experiences with gastric lavage on former occasions or after former operations. Several of our patients have had prolonged regurgitation of large amounts of bile and duodenal contents. In the past this always signified much distress from retching and vomiting and repeated seances with the stomach tube. With this method the stomach could be lavaged as often as desired merely by drinking a sufficient amount of water.

In order to give some idea of the types of operations in which prophylactic gastrostomy has been applied, the following brief abstracts of forty-four clinical histories are submitted, together with three cases in which gastrostomy was performed some days after the main operation.

### ACUTE PERFORATIONS OF GASTRIC AND DUODENAL ULCERS

Case 1 was a male, aged 50, operated on thirtv hours after an acute perforation of a duodenal ulcer with progressive peritonitis. Owing to the patient's desperate condition, it was thought best to disturb the duodenum as little as possible. The edges of the ulcer were simply approximated with one mattress suture and an omental flap tied over it. Gastrostomy was made to keep the stomach and duodenum collapsed and at rest. Drainage of the peritoneal exudates was established in the lower abdomen. The gastrostomy tube discharged large quantities of gas and intestinal fluid for several days. The patient recovered.

Case 2. Male, aged 23, with an acute perforation of a juxtapyloric ulcer and beginning peritonitis. Closure of the ulcer, pyloroplasty and gastrostomy were made, followed by prompt recovery.

Case 3. Male, aged 53, with an acute perforation of a duodenal ulcer of four hours' duration. The ulcer was closed and covered with omentum, and gastrostomy made. A second incision was made in the lower abdomen for drainage. Recovery was uneventful.

Case 4. Male, aged 55, had a perforated duodenal ulcer of forty-eight hours' duration. Operation: Closure of ulcer with a puckering suture and covering it with an omental flap; gastrostomy. Patient made a good recovery.

Case 5 was a man, 42 years of age, operated on for an acute perforation of a duodenal ulcer. The opening in the duodenum was closed and reinforced with an omental tag, and gastrostomy made. A thirteen hour leakage before operation had started a progressive peritonitis which raised havoc in the lower abdomen. The absorbed infection involved the lungs, and the patient died from septic pneumonia at the end of a week. The absence of all distension in the epigastrium during the entire time after the operation was an interesting and instructive feature in this patient. The autopsy showed the stomach and duodenum collapsed and the omentum holding tightly over the perforation, with no evidence of infection in the upper regions of the abdomen.

Cases 6, 7 and 8 were males, aged 29, 34 and 66. The first two were operated on for acute perforations of duodenal ulcers and the third for perforated gastric ulcer, with advanced peritonitis. These three died from the infection in spite of gastrostomy and all other forms of treatment.

### CHRONIC GASTRIC AND DUODENAL ULCERS

Case 9. Male, aged 56, had pylorectomy and gastroenterostomy made for gastric ulcer, together with gastrostomy. The operation was followed by severe lung complications, but the abdominal conditions remained very satisfactory throughout his convalescence.

Case 10. A physician, aged 45, with a chronic perforating pyloric ulcer and extensive inflammatory infiltrations in the gastric wall. Polya pylorectomy, jejunojejunostomy, and gastrostomy were performed. Recovery was prompt and comparatively free from epigastric disturbances.

Case 11. Female, aged 48, had a chronic perforation of a duodenal ulcer communicating with a cavity in the pancreas. Case 12 was a male, aged 34, who had a similar condition. Pylorectomy, gastroenterostomy, and gastrostomy were made in both. Case 13. A male, aged 57, had his duodenum deeply retracted and covered with massive adhesions due to chronic ulcer for which gastroenterostomy and gastrostomy were made. Case 14, male, aged 22, and Case 15, female, aged 30, had pyloric stenosis from chronic ulcers. Pyloroplasty and gastrostomy were made in both. In Case 16, male, aged 21, an excision of a chronic duodenal ulcer, pyloroplasty and gastrostomy were performed.

Case 17. A girl, 21 years of age, had a chronic perforation of an ulcer at the pylorus, surrounded by heavy adhesions throughout the subhepatic region. The adhesions were removed; the ulcer was excised; pyloroplasty, omentoplasty and gastrostomy were made.

Case 18 was a man, aged 53, with pernicious anemia. In spite of this diagnosis it became necessary to do a gastroenterostomy because of a progressive stenosis of the pylorus, due to cicatrization from an old duodenal lesion, the nature of which was not fully determined. Gastrostomy was made for his comfort and to obviate postoperative bleeding.

Case 19, a male, aged 39. Posterior gastroenterostomy and cholecystectomy were made for chronic duodenal ulcer and cholelithiasis, followed by gastrostomy.

In these nine cases prophylactic gastrostomy was made because the operations had been severe in character, requiring an unusual amount of handling and retracting of the organs, and also to insure a safe and comfortable convalescence. The recovery in all of them was much easier than it would have been in a similar group without gastrostomy. They had no distension, nausea or emesis, and required less opiates, nursing and worry than otherwise would have been the case.

### VENTRAL INCISIONAL HERNIAE

Case 20. Male, aged 40, had been operated upon for gallstones a few years previously and had a protrusion in the scar, the size of two fists. A subphrenic abscess had followed the operation and this had been drained through a thoracotomy with resection of the right eleventh rib. At the place of the thoracotomy was a second thoracic hernia, within which the right lung played in and out at each respiratory effort. The repair of the ventral hernia proved exceedingly difficult because of the attenuated aponeuroses.

Case 21. Male, aged 65, reported that he had suffered seriously from protracted postoperative emesis at the time of a cholecystectomy performed some years previously. The wound had reopened at that time and attempts at secondary closure of the wound had been made. There was a wide hernial defect. The patient also had intermittent attacks of intestinal obstruction with much pain and distension. It was found at operation that these attacks were caused by multiple, stenosing, intestinal adhesions. Several loops of the small intestine were incarcerated in the hernial sac. The unravelling and freeing of the intestine inflicted numerous traumatizations of the serosa and necessitated suturing of many denuded areas. An indistinct mass was palpated in the neighborhood of the pylorus under a matting of adhesions, but it was not considered advisable to explore this thoroughly, owing to the severity of the surgical trauma already inflicted. This case will be referred to later.

Case 22. A man, aged 47, had an enormous hernia in the epigastrium with a thin covering of scar tissue. A cholecystostomy had been made a year previously. A sinus, discharging pus and occasionally bile, was located in the midline near the umbilicus. At operation this sinus was found to lead into a pocket of granulation tissue, the wall of which was made up largely from a loop of jejunum. Another open sinus from the gallbladder formed a connection with this abscess cavity. Cholecystectomy was made and two feet of the jejunum, comprising the infiltrated and infected abscess wall, were resected.

After completing the intraabdominal work in these three cases, extensive dissections of the abdominal wall were made before sufficient overlapping of fasciae could be obtained to give some reasonable hope for permanent cures of the herniae. In spite of all effort it was evident in all three cases that the main holding sutures were under considerable tension, even when the patient was narcotized. Experienced surgeons will understand readily the possibilities for regurgitation and overdistension under these conditions. Some may even remember instances when the postoperative straining caused serious damage to the wound and nullified the expected success of the operation. Gastrostomy was made in each of these cases and there was neither distension nor emesis after the operation. The entire period of recovery was uneventful.

## UMBILICAL HERNIA

Case 23. A woman, 69 years of age, had an umbilical hernia of large size and long duration. After the incarcerated contents, consisting of omentum, colon and several loops of small intestine, had been liberated, it was extremely difficult to replace them into the abdomen because of their volume and the decreased abdominal capacity which often accompanies large hernial protrusions of long standing. After finally succeeding in closing the hernia, gastrostomy was made. The postoperative troubles from distension were minimal.

## OPERATIONS ON THE BILIARY TRACT

Case 24. A woman, aged 65, had had several attacks of biliary colic with jaundice, last attack beginning two months before operation; whole body bronzed from increasing jaundice; patient very ill from cholemia. At operation the gallbladder was found obliterated in the center of dense matting adhesions; ducts were greatly dilated from one large stone behind duodenum; complete occlusion of common duct was present. Choledochoduodenostomy and gastrostomy were made. Large amounts of bile escaped from gastrostomy tube for six days. The gastric secretion had become normal when the tube came out on the ninth day. Patient made a good recovery without distension, nausea or other complications so often encountered under similar conditions.

Case 25. Male, aged 38, had had a cholecystectomy at a previous operation and was suffering from recurring attacks of pain, associated with fever and jaundice. He had frequent emesis, almost constant nausea, and showed marked emaciation. At operation the pancreas was found enlarged, the common duct distended and edematous, but without stones. A choledochoduodenostomy was made. There was a marked anemic and icteric appearance of the sutured structures and much concern was felt in regard to prompt and safe healing. The fact that regurgitation and emesis had become habituated with the patient gave further emphasis to our anxiety. Prophylactic gastrostomy was therefore made. Bile soon began to flow freely from the gastrostomy tube and continued to do so for several days. There was no distension, no retching and no vomiting. Healing was practically symptom free; the jaundice cleared rapidly and the recovery apparently was permanent.

Case 26. A woman, 47 years of age, was operated on for common duct obstruction and jaundice. A cholecystectomy had been made two years previously, and this had been followed by a very stormy recovery. Operative findings: Pylorus and duodenum firmly adherent to under surface of liver; pancreas enlarged; hepatic and common ducts dilated, and contained stones; common duct stenosed in duodenal wall. Operation: Choledochoduodenostomy; omental flap sutured over all raw surfaces on stomach and duodenum; gastrostomy. Results: Bile and black liquids with strong fecal odor escaped through the tube in large quantities for four days. The patient had no nausea or emesis and convalesced with a minimum of discomfort.

Case 27. Female, aged 47, was operated on for recurrent jaundice following operation one year previously for stones in gallbladder and ducts. The postoperative recovery after the former operation had been associated with gas distension, emesis, lavages, etc. for many days. Extensive adhesions were separated; choledochoduodenostomy was made, followed by gastrostomy. The recovery was easy and free from all of the distress which followed her former, a much simpler operation.

Case 28. Female, aged 29, was found at operation to have a fistula between the gallbladder and the duodenum, following an old perforative cholecystitis. The repair required the excision of a rather large section of the duodenal wall, which left a very feeble and unsatisfactory suture line in the duodenum. Therefore, gastrostomy was made as a precaution against postoperative overdistension. There was a profuse biliary discharge from the tube for several days, but the patient was comfortable and the recovery prompt.

Case 29 was a lady, 57 years of age, with chronic cholecystitis and extensive adhesions about duodenum, pylorus and subhepatic region. Cholecystectomy, pyloroplasty, plastic omentopexy and gastrostomy were made. The hospital record reads, "No postoperative reaction, uncomplicated recovery."

Case 30. A woman, aged 50, had a cholecystectomy, gastroenterostomy, and gastrostomy performed for cholecystitis and duodenal ulcer with adhesions extending over the pylorus and stomach. Again, the hospital record states, "No postoperative reaction."

Case 31. Female, aged 55, with acute cholecystitis. Cholecystectomy made. Pulmonary infection, regurgitation and alarming emesis followed the operation. Gastrostomy was not made until the *third* day. The patient died. It was believed that, if gastrostomy had been done at the time of the primary operation, the patient's life would have been saved.

Case 32. Female, aged 47, was operated on for cholelithiasis with chronic jaundice. Stones were removed from the gallbladder and hepatic duct; common duct was contracted and impervious to probing. Gallbladder was anastomosed to the stomach and gastrostomy made. This patient died from postoperative pneumonia.

### GUNSHOT WOUND

Case 33. A man, aged 45, was shot in the left thorax with a revolver, the bullet perforating the splenic flexure of the colon. There was a beginning peritonitis and much abdominal distension. After closing the wound in the colon and draining the infected peritoneum, gastrostomy was made. The distension subsided early, emesis was absent, and recovery rapid.

### CARCINOMA OF STOMACH

Case 34. Female, aged 55. Gastrostomy was made after pylorectomy and posterior gastroenterostomy for carcinoma at the pylorus. Her postoperative recovery was comparatively free from symptoms.

### INTESTINAL OBSTRUCTION

Case 35 was a female, aged 28, suffering from an enormous dilatation of the duodenum, due to an ileus at the duodenojejunal junction caused by adhesions following a previous laparotomy. The second and third portions of the duodenum corresponded to the pyloric half of the stomach, both in volume and in thickness of walls. Duodenojejunostomy was made, together with extensive liberations of adhesions and plastic closures of the serosa. Serious distension and regurgitation followed. Gastrostomy was performed, not at the time of operation as it should have been, but on the *fourth* day. The relief was too late. The patient died from intestinal toxemia. We are convinced from later experience that, if gastrostomy had been made at the time of operation, recovery would have followed.

Case 36. Male, aged 59 (the author of this article), was operated on for intestinal obstruction and cholelithiasis. Extensive adhesions following a previous laparotomy required handling of the entire intestinal tract with suturing of several areas of denuded serosa. Cholecystectomy was also made, and in addition, a gastrostomy. Although intestinal paresis followed the operation and lasted several days, the patient did not suffer seriously from intestinal toxemia. The regurgitating intestinal contents escaped freely through the gastrostomy tube until peristalsis was reestablished. It was the consensus of opinion among the surgeons in charge that the patient owed his recovery to the presence of the safety valve now under discussion.

Case 37. Male, aged 53, operated on for strangulated hernia in an old right rectus scar after an appendectomy twenty years earlier. Distension, regurgitation and emesis followed. Enterostomy and gastrostomy were made on the *sixth* day after operation, but the patient died from paralytic ileus and intestinal toxemia. A prophylactic gastrostomy did not seem indicated at the primary operation, but had it been done at that time, the patient would have had a much better chance for his life.

Case 38 was a man, 69 years of age, with an intestinal obstruction of four days' standing. He was too ill for radical operation. Colostomy and gastrostomy were made. He died of uremia on the fourth day.

### DUODENAL DIVERTICULA

Cases 39 and 40. Females, aged 34 and 43, were operated on for duodenal diverticula. The diverticulum in each case was located posteriorly and closely attached to the pancreas. Because of the difficult location, it was uncertain after removing the mucous membrane pouch whether the opening had been closed properly, and fear was entertained that postoperative overdistension might produce leakage and infection. Gastrostomy, therefore, was made in each case and both the immediate reactions and the final results were gratifying.

### VISCEROPTOSIS

Cases 41 to 47 (inclusive). The last seven cases in this series were in patients who were operated on for various types of visceroptosis, four were females and three males, their ages ranging from 20 to 32. Duodenojejunostomy was made in six of the seven. In addition, a number of other forms of technic were followed out, such as gastropexy, pyloroplasty, colofixation, omental grafting and various plastic reconstructions of the abnormal peritoneum. The gastrostomy tube was passed through the pylorus and into the duodenum in some of these cases in order to make sure of a complete and constant duodenal relaxation. An opening on the side of the tube provided for the gastric evacuation.

It is admitted that most of these patients might have recovered from their operations without the application of prophylactic gastrostomy. However, if this method had not been used, the multiple forms of technic which were practiced on a number of the patients could not have been done as one-stage operations without running unwarranted hazards with life. The comparative freedom from postoperative pain and distress has not been the least of its recommendations. In no case has this complementary procedure appeared to be an additional operative risk, but quite the contrary.

The majority of the patients have been "followed up" since leaving the hospital. Up to date no late symptoms due to perigastric adhesions at the site of the gastric drainage have been found in any of the patients, the first of whom was operated on three and one-half years ago.

The liquid discharges from the gastrostomy tube, in all cases which had operations on the stomach and duodenum, showed that no postoperative bleeding had taken place from any of the visceral suture lines. We believe that it is justifiable to assume that the quiet rest given to the operated area by keeping the stomach and duodenum empty and collapsed had a favorable influence in the maintenance of perfect hemostasis. Under former methods, when distension sometimes followed operations on the stomach, it was not uncommon to see some blood stains in the vomitus even two or three days after operation. Although the number of operations is too small to warrant any general conclusions, it is, nevertheless, worthy of note that inquiry has failed to reveal any symptoms of peptic ulcer among those who had gastric operations.

What influence this technic may have in the prevention of paralytic ileus cannot be stated definitely. But it should be noted that no patient died from paralytic ileus, when the gastrostomy was made at the time of the main operation. In the two deaths in this series which could be definitely ascribed to this cause, the patients did not have gastrostomy done until after the ileus had already become established and threatening to the patient's life.

Haberland of Köln, in an article in this month's number (May, 1930) of "der Chirurg," urges gastrostomy immediately on the first appearance of paralytic ileus, and before gas distension has caused serious damage to the gastric and intestinal walls. Gastrostomy, according to his opinion and experience, offers the patient a better chance for life than any other form of treatment in paralytic ileus.

This prophylactic method had been so uniformly satisfactory in our experience that we almost overlooked the possibility of any contraindications to its application. One observation was made which should be recorded, however, because it brings to attention not only an undiagnosed lesion in the abdomen, but also an unexpected complication after gastrostomy. The facts in the case point to a definite contraindication.

In case 21, recorded above, an unexplained tumor mass was palpated near the pylorus. It was asssumed at the time that it was due entirely to a matting of adhesions in the subhepatic space, following the previous infection and operation on the biliary tract. The postoperative recovery of the patient was very satisfactory after the ventral herniotomy. However, there was a slight leakage for a few days after the removal of the gastrostomy tube and the sinus did not heal as promptly as in other cases. The patient went home, but returned after three months with the history that soon after leaving the hospital, serious gastric symptoms had developed. He had become unable to eat anything but liquids and he had lost much in weight. In the skin at the place where the gastrostomy tube had been was a hard granulating nodule which, on sectioning, was found to be carcinoma. The tumor palpated at the operation proved later to be a carcinoma near the pyloric end of the stomach, from which death followed in a few weeks. Cancer cells present in the stomach had found their way into the gastrostomy sinus and travelled its entire length. This object lesson is worth remembering when questions of malignancy are pending.

Prophylactic gastrostomy has been found in our experience to be a safe, simple and life-saving procedure. Its technic and usefulness should be known to every medical man who may be called upon to perform emergency laparotomies for any cause. It recommends itself even more to the occasional operator than to the experienced and expert surgeon, because the postoperative course of the patient is likely to be more uneven and distressing at the hands of the former than under the management of the latter.

# THE BROADENING FIELD OF NEUROSURGERY *

George W. Swift, M.D.
and
Paul G. Flothow, M.D.
seattle, wash.

The medical profession as a whole still considers the neurosurgeon a brain surgeon. With the exception of those interested in neurology, neurosurgery and allied subjects, it is doubtful whether many realize the tremendous advances which have taken place and are proceeding apace in the field of neurosurgery. It is only within recent years that there has arisen the specialty of neurosurgery. It has only been within the last ten or even five years that many of the younger men have taken up this work as a specialty. To a few pioneers who were willing and courageous enough to face a tremendous mortality, and often a great deal of derision, must go the credit for the development of brain surgery per se to its present status, where its results and mortality compare quite favorably with those of many fields in general surgery.

Coincident with this advance in the technic of brain surgery, there has been a rapid broadening of the field, so that now the brain surgeon is no longer a brain surgeon only; he is also a cord surgeon, a nerve surgeon, a neck and chest surgeon and an abdominal surgeon.

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* Read before the Southwestern Idaho Medical Society, Boise, Ida., March 26, 1930.

The purpose of this paper is to give a brief resume of some of the many surgical procedures which have become accepted and some of those that are being developed in this new field.

### INTRACRANIAL OPERATIVE PROCEDURES

Most of you are no doubt familiar with the remarkable strides that have been made in brain tumor surgery. It has not been many years since a brain tumor, or an operation for one, was considered the death knell. While the mortality is still high, it is certainly not that bad. Many cases are cured and many more obtain years of relief.

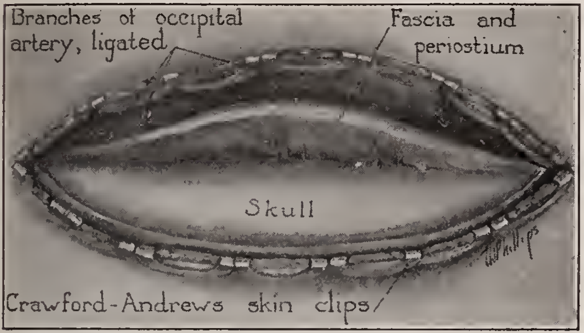
Branches of occipital artery, ligated
Fascia and periostium
Skull
Crawford-Andrews skin clips
J.W.Phillips

Fig. 1. Crawford-Andrews skin clips.

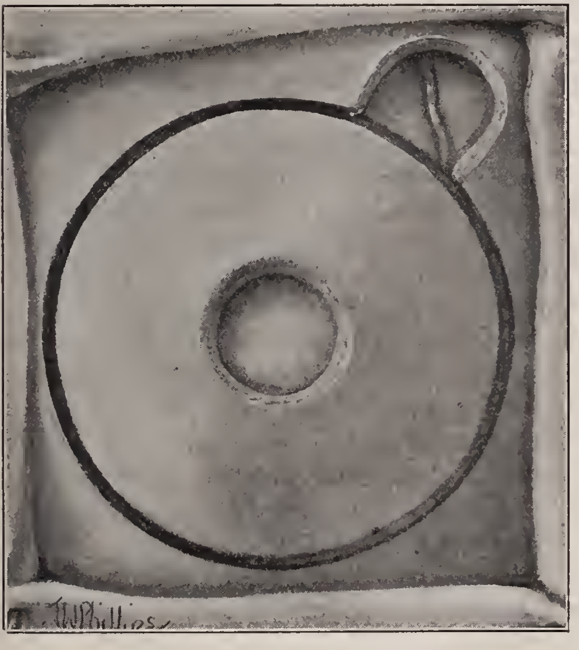

Fig. 2. Trephine opening for subdural hemorrhage with ligation of middle meningeal artery and replacement of bone.

We shall not discuss brain tumor surgery except to point out a few things which have contributed to its advance. A very important consideration is the development of rapid, accurate and comparatively hemostatic surgical technic. The day of the neurosurgeon taking four or five hours to do an operation is rapidly drawing to a close. With newer methods of turning an osteoplastic flap and controlling hemorrhage, the time of brain operations has been reduced so that it takes no longer than many of the major intraabdominal operations.

The Andrews clip has aided greatly in reducing the time of operation and has made hemostasis of the flap much easier. These clips replace the dozens of hemostats which are usually employed. The clip is a small malleable device which is clamped onto the edges of the flap and left in place throughout the operation (fig. 1). Newer methods of cutting the bone are replacing the gigli saw and trephine (fig. 2). Soutar, in England, describes an instrument by means of which it is possible to turn a flap in less than five minutes. Various motor driven saws are being used which materially lessen the time of operation.

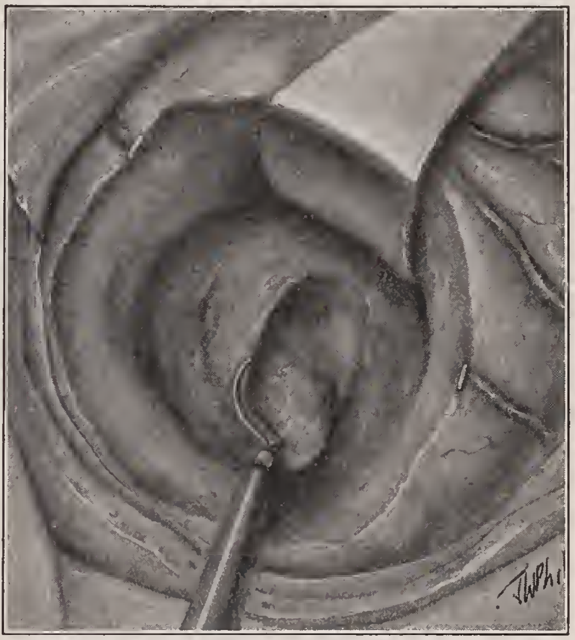

Fig. 3. Enucleation of subcortical infiltrating glioma with endothermic loop.

The introduction of the Bovee-Cushing and other electric operating devices has opened up new avenues of approach in brain tumor surgery. By means of this type of apparatus it is possible to remove a whole lobe of the brain bloodlessly, rapidly and with very little shock. Tumors which formerly were inoperable are now easily removed. All tumors are now operable except those whose position in vital centers renders their removal impossible (fig. 3).

The accurate localization of brain lesions, using modern methods, has aided very materially in the advance of brain surgery. It is rare now to find an unlocalizable lesion or to operate on the wrong side. This improvement has been accomplished by more accurate clinical diagnosis, coincident with the advance in our knowledge of the symptomatology of brain lesions and more accurate accessory diagnostic methods, especially cerebroventriculography.

Cerebroventriculography is the introduction of air into the ventricles of the brain either by direct tap or indirectly by the lumbar puncture route, and the roentgenographic studies of the ventricles so outlined. By these methods most brain tumors may be accurately localized. The direct method is fraught with considerable danger and is best used only when the intralumbar method fails. The latter method, which consists in doing a spinal puncture and removing fluid in five cubic centimeter amounts and replacing with equal amounts of air, up to fifty cubic centimeters and even more, is a very simple and useful procedure. We have done it over six hundred times without a fatality and without serious untoward effects, this in spite of the fact that many neurosurgeons condemn it as a dangerous procedure. We feel that the direct method is much more dangerous and use it only where a tumor is unlocalizable by any other means.

So much for the advances in brain surgery. We will now take up the other intracranial operative procedures of interest.

### TRAUMATIC CRANIAL SURGERY

We will not discuss the surgery of cranial trauma at length. We merely call attention to the fact that it has been a very few years since a fractured skull meant almost certain death. Skull fracture cases were hospitalized and lived or died on their own merits. The treatment was to put them to bed and see what happened. Naturally, most of them died. Or the other extreme was practiced and many needless, useless and fatal operations were performed. As a consequence, traumatic brain surgery was placed in disrepute and in the minds of many is still so.

By experience we have found quite definite indications as to when to operate and when not to operate. Consequently, the mortality of skull fractures has been reduced to a much lower point. With further study it will be decreased still more in both the operated and unoperated cases.

### TRIFACIAL NEURALGIA

There are three recognized methods of treating this distressing condition: (1) Alcohol injection, (2) peripheral avulsion of the several divisions of the nerve, and (3) section of the posterior sensory root of the gasserian ganglion.

Alcohol injections give temporary relief in about 75 per cent of cases. The duration of relief averages about nine months, when they must be repeated. Relief is usually for shorter duration with successive injections until it becomes necessary to do the major operation on the ganglion.

Peripheral avulsion is a palliative procedure of questionable worth which gives, as a rule, only temporary relief, and may not be repeated. The major operation of severing the posterior sensory root of the gasserian ganglion is one of the most satisfactory procedures in any field of surgery. The results are almost uniformly successful, the mortality is very low and it offers a permanent cure with a very low morbidity.

The original operation consisted in a removal of the entire ganglion but this resulted in such a large percentage of corneal ulcers, and consequent loss of the eyes, that Frazier[1] was led to develop a technic which preserved the first division and consequently preserved corneal sensation. Adson[2] has a technic for preservation of the motor root and avoids the formation of corneal ulcers by careful postoperative protection of the eye. The technic of this operation is pretty well standardized. In the hands of the experienced neurosurgeon it is not difficult, but should not be attempted by one unfamiliar with the difficulties which may arise.

Dandy[3] has recently advocated the intracranial section of the trifacial nerve through a cerebellar approach. He states that in this way he preserves corneal sensibility. It may be that this will in time become the method of choice in the surgical treatment of trifacial neuralgia.

### GLOSSOPHARYNGEAL NEURALGIA

The intracranial section of the glossopharyngeal nerve for glossopharyngeal neuralgia, as advocated by Adson,[4] is another development. This type of neuralgia is frequently mistaken for a trifacial neuralgia, but it does not respond to the treatment of the latter condition. It is very similar to trifacial neuralgia and the pain is just as severe, if not more so. It differs mainly in that the pain is deeper, and the ear and the pharynx are affected. The differential diagnosis should be facilitated by the recent introduction of trethylene, which is said to have a specific effect upon the trifacial nerve and thus would not affect glossopharyngeal neuralgia.

Fay[5] believes that the pain of so-called glossopharyngeal neuralgia is really due to vagus branches which are sectioned along with the glossopharyngeal in the operation and suggests the name vagus auricular pharyngeal neuralgia. We[6] have recently done some work which indicates that some of the severe facial pains we encounter are probably of sympathetic origin.

### PAIN IN MALIGNANT CONDITIONS

Fay[7] also reports some striking results in the surgical relief of pain in extensive malignant diseases. He sectioned a portion of the vagus and the glossopharyngeal nerves intracranially and the upper posterior cervical nerve roots as they emerge from the spinal cord. In some cases also the section of the sensory root of the gasserian ganglion was necessary. We[8] have advocated the use of alcohol injections to replace many of these major procedures in this type of case.

### INTRACRANIAL HEMORRHAGE

Sharpe,[9] in his recent volume on neurosurgery, reports excellent results in the treatment of intracranial hemorrhage in the newborn by early subtemporal decompression and drainage. He also reports good results in the treatment of external hydrocephalus by a subtemporal decompression and drainage of the excess spinal fluid through the temporal muscle into the scalp. He also reports several other intracranial maneuvers which may be developed to a point of great usefulness.

Naffziger[10] and others are doing some excellent work in the operative treatment of cerebral apoplexy in young individuals. These are usually small hemorrhages in the region of the internal capsule and early trepanation and drainage has resulted in some startling and rapid recoveries. When these cases are not operated upon, a permanent hemiplegia frequently results, due to actual destruction of nerve fibers in the capsule and the formation of scar tissue.

### EPILEPSY

A great deal of work is being done on the operative treatment of idiopathic epilepsy. We[11] believe that pressure relations in the dural sinuses play an important part in the initiation of the convulsions. These cases usually have a high degree of microcephaly of the posterior fossa of the skull. This results in an increased pressure on the sigmoid sinuses which in turn cause increased pressure in the transverse and the superior longitudinal sinuses. This pressure interferes with the easy entrance of the cerebrospinal fluid into the longitudinal sinus. A wide decompression of the posterior fossa is done so as to allow free expansion of all of the structures (fig. 4). This relieves the pressure from the transverse and sigmoid sinuses. Sufficient time has not elapsed to estimate the value of the procedure but in some cases the results have been very good.

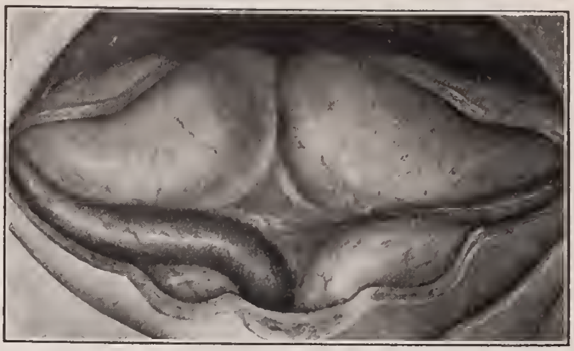

Fig. 4. Large right transverse sinus, rudimentary left sinus, with small emissary at the torcular.

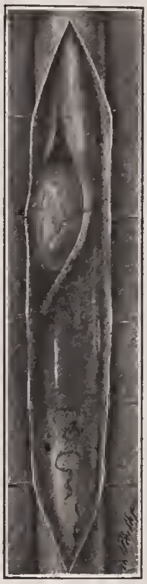

Fig. 5. Tumor arising from nerve and compressing spinal cord.

So much for the field of cranial surgery. There is a great deal of work being done that has not been mentioned. Suffice to say that cranial surgery is advancing fast and the future holds promise of continued progress.

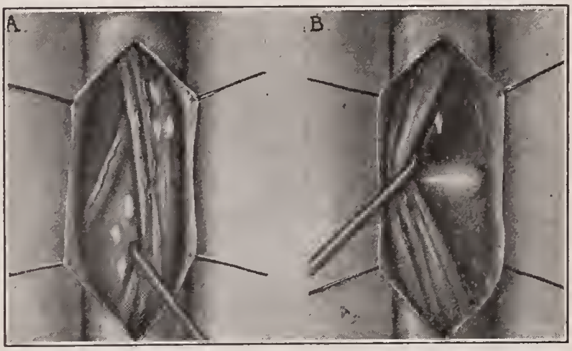

Fig. 6. A, Calcified plaques attached to arachnoid. B, Caudal filaments are retracted, exposing embedded bullet.

### SURGERY OF THE SPINAL CORD

In extracranial neurosurgery even more fields are being opened. Spinal cord surgery has long been very satisfactory. What is more gratifying to the surgeon than, following the localization of a cord tumor, laminectomy disclosing a nonmalignant neurofibroma, easily removed and the patient saved from total paralysis and incontinence (fig. 5).

Our knowledge of the treatment of traumatic injuries of the cord is steadily advancing. Many cases which were previously allowed to go unoperated upon, with consequent permanent paralysis, are now benefited enormously by early laminectomy and decompression (fig. 6).

### RHIZOTOMY

Posterior rhizotomy, the severing of the sensory nerve trunks as they leave the cord for the relief of pain in malignancies, has already been mentioned in connection with Fay's work. This opens a broad field in the treatment of various painful conditions of nerves of cervical and upper thoracic origin. Frazier[12] reports very good results from rhizotomy for the relief of pain. Three cases for gastric crises, two of brachial plexus injuries and one each of amputation pains, upper extremity, metastatic carcinoma of thoracic spine, intercostal neuralgia and sarcoma of lumbar spine are reported. While the final results were not absolutely satisfactory in all of these cases, the remarkable results of some of them were so gratifying as to warrant further work along these lines. Spasmodic torticollis has been relieved by a similar procedure.

### CORDOTOMY

Spiller's[13] suggestion to cut the spinothalamic tracts for painful malignancies of the pelvis has given us a surgical method for the relief of pain which has found a rather wide application. Martin and Frazier[14] were the first to act upon Spiller's suggestion and since the publication of their work many other surgeons have used this procedure with excellent results.

The operation consists of an incision of the spinal cord from 2.5 mm. to 3 mm. in depth, so placed as to sever the anterolateral columns which carry pain and temperature sense. The ideal type of case, of course, in which this operation is used is in malignant conditions, particularly of the pelvis, causing unendurable pain. The operation, although technically rather exacting, is not a hard one from the standpoint of the patient. It may be applied as high as the seventh cervical segment and as low as the lumbar region, but it is best performed at the upper thoracic levels. It may be done for any major pain of the lower limbs and trunk that is severe enough to warrant such a radical procedure.

### INJECTIONS

Various injection methods, using 80 to 95 per cent alcohol and various anesthetic solutions, have found a secure place in therapeutics. Alcohol injection for trifacial neuralgia is a very efficient measure for temporary relief of the excruciating pain. We have injected the third division of the trifacial nerve for a painful malignancy of the jaw, with immediate and lasting relief of the pain. There is no doubt that the injection of alcohol may be applied to many other painful conditions of sensory nerves, such as postherpetic neuralgias and traumatic neuritis.

The injection of anesthetic agents into the spinal canal for producing surgical anesthesia is developing rapidly and there is no doubt that in proper hands it is a safe and useful agent.

The injection of novocaine epidurally for the relief of sciatic neuralgia, while still in the more or less experimental stage, is of proven value and the results in some cases are remarkable. When this injection is successful, it is immediately so and often permanently.

Sharpe[15] reports some good results in reconstructive measures in postpoliomyelitic paralysis by intradural anastomosis of nerve roots, utilizing the eleventh and twelfth thoracic roots and anastomosing to the fourth lumbar and second sacral.

### FACIAL PARALYSIS

There are a good many examples of excellent results in this field of neurosurgery. Probably none are more striking than the results of nerve anastomosis to relieve facial paralysis. The usual cause of traumatic facial palsy is severance of the nerve during mastoid operations or in operations for glands of the neck. The resulting deformity is severe, and the source of much anxiety to the patient.

Ballance[16] has been a pioneer in the treatment of this condition. He has utilized all available nerves and has done every type of suture. He now believes anastomosis of the facial to the glossopharyngeal nerve to be the operation of choice, but most authorities prefer the hypoglossal or the spinal accessory. Theoretically, the hypoglossal seems to be the better choice, since it is not followed by the shoulder drop which occurs when the spinal accessory has been utilized. However, those authorities, such as Adson,[13] who prefer the spinal accessory, do a further anastomosis of the distal segment of the nerve to the ansahypoglossal, thus avoiding this complication. At any rate, the results in the various types of anastomosis are excellent and there is no reason why these individuals should be allowed a permanent paralysis.

### RECURRENT LARYNGEAL PARALYSIS

Frazier[17] reports some hopeful results in recurrent laryngeal paralyses, utilizing the descending hypoglossal nerve. Ballance[18] has anastomosed the distal end of the recurrent laryngeal to the side of the corresponding phrenic nerve with good results and only a temporary paralysis of half of the diaphragm. There is much more work to be done along these lines.

### EPIDEMIC HICCOUGH

Dowman[19] reports several cases of epidemic hiccough, probably due to encephalitis, in which operations on the phrenic nerves were very successful. In his early cases he actually severed both phrenic nerves with cure of the hiccough and no apparent ill effects. The diaphragm became paralyzed but the accessory muscles of respiration rapidly took over the diaphragmatic functions. In his later cases he accomplished the same result by freezing the phrenic nerves. This stops the hiccoughs and the function of the diaphragm returns in three weeks time.

### BRACHIAL PLEXUS INJURIES

In the field of brachial plexus injuries much work has been and is being done. Sharpe[20] advocates operation in all cases of birth palsy, where there is no improvement in one month after birth. Often all that is necessary is a freezing of scar tissue around the brachial plexus. However, if the nerves are severed, they should be anastomosed. He reports excellent results in these cases and surely the operation should be tried as there is everything to gain and nothing to lose.

### CERVICAL RIB

Adson[21] has recently perfected a brilliant operation for cervical rib. The previously accepted operation was the removal of the offending rib. This is at times a very formidable procedure. It amounts to a posterior decompression of the brachial plexus and the subclavian artery by the removal of the rib. Using Adson's technic, the approach is made at a different angle. He separates the scalenus anticus from its attachment to the first rib, thus giving the compressed structures ample room anteriorly. It accomplishes the same result and is a much simpler and safer procedure. The results from this operation are excellent. It has become the recognized treatment for cervical rib which is causing symptoms.

### NERVE SUTURE

Bunnell[22] and others have done excellent work in the field of nerve suture. Almost any nerve, no matter how small, is amenable to suture, and there is no reason why patients having traumatic injuries to peripheral nerves should be allowed the consequent paralysis and sensory disturbances.

### TARDY ULNAR PALSY

The ulnar nerve, because of its superficial course in the elbow, is subject to a great deal of trauma. A rather frequent condition which is the result of repeated minor injury to this nerve is the so-called tardy ulnar palsy. This condition is gradual in onset. Its first symptoms may be an evanescent tingling in the ring and little fingers, gradually progressing until motor signs appear, and the typical claw hand is the result. As the injury progresses there is increasing formation of fibrous tissue within the nerve sheath; it becomes definitely thickened and consequently is more subject to trauma. As this thickening occurs, there is less room in the ulnar groove and on flexion of the forearm, the nerve is definitely stretched so that mere motion of the arm adds to the trauma and in time the nerve may be entirely destroyed at this point. The treatment of this condition consists in a transplantation of the nerve from its exposed course to a new channel under the flexor group of muscles. If operation is done early, all that is necessary is transplantation; if it be late, it is necessary to resect a portion of the nerve and do end to end anastomosis before transplantation. Naturally, the sooner operation is performed, the better are results and the quicker the return to normal function. However, even when the function is wholly gone and resection is necessary, the results are very good.

The musculospiral nerve is the one most frequently injured. It passes around the humerus in a position where it is frequently injured in fractures of this bone. If not injured at the time of fracture, it is often caught in the resulting callus and becomes functionless. In cases of musculospiral injury the nerve should be explored, sutured if necessary, and freed of callus, if that is where the trouble lies. The same holds true for the median nerve when injured.

### SYMPATHETIC NERVOUS SYSTEM

Our knowledge of the sympathetic nervous system until two or three years ago was very elementary. We all knew that it was present in the

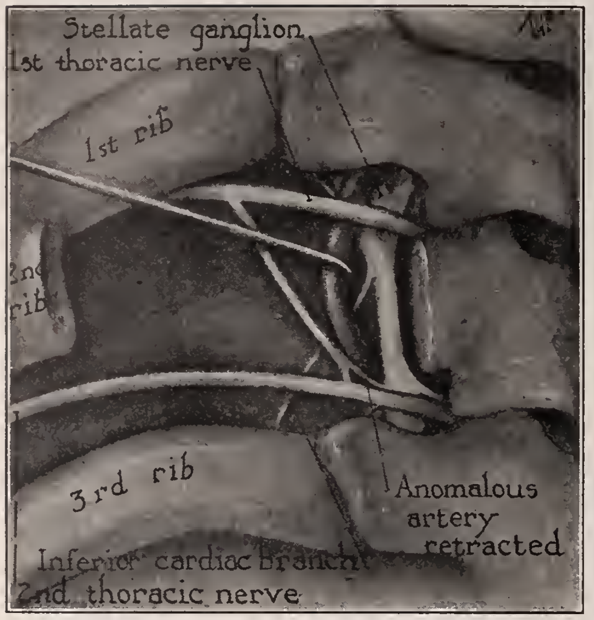

Fig. 7. Demonstrates the anatomic relations of the stellate ganglion and sympathetic trunk on left side.

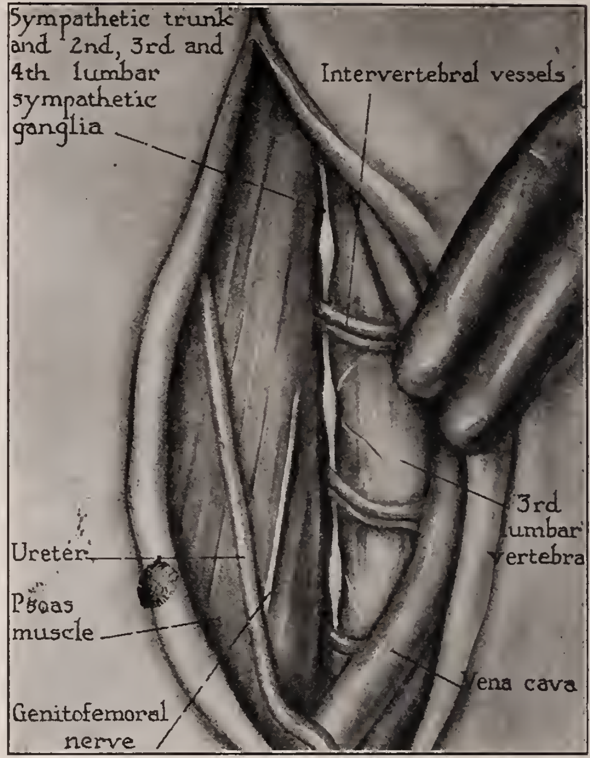

Fig. 8. Illustrates the anatomy of right lumbar sympathetic chain, showing peritoneum cut and retracted.

human body and we assumed it probably had some function and that is about as far as most of us got. As far as the anatomy is concerned, Ranson[23], Kuntz[24] and others have done some very fine work and, while we are still in the dark on many points, we now have a rather comprehensive knowledge of at least the general structure of the sympathetic system (fig. 7). As to functions we know many, we conjecture about others, and are probably still very ignorant of most of them. Its functions in general as they are known now may be grouped under the heads of (1) vasomotor, (2) glandular, (3) sphincteric, (4) cardiac, (5) some relation to muscle tone, (6) control of involuntary muscle and (7) relation to pain.

All of these functions are not clearly established. Some of them are disputed, and the last, having to do with pain, has been absolutely denied by all authorities until very recently. Now they are beginning to admit the possibility of the sympathetic fibers carrying painful stimuli. We[25] have recently published some work which indicates that the sympathetics do this.

### PERIARTERIAL SYMPATHECTOMY

This paper is not intended to discuss the relative merits of the various procedures nor to justify them, but merely to set before you some of the various things that are being done.

LeRiche,[26] after whom periarterial sympathectomy has been named, is considered the author of this type of surgery and has done more than any other man to advance its application. Good results have been reported[27] in a variety of conditions, among them causalgias, trophic ulcers, intermittent claudication, Raynaud's disease, Buerger's disease, arteriosclerotic gangrene, scleroderma, varicose ulcers, etc. While we do not subscribe to the use of this operation in all these conditions, and while most of us do not get as good results as LeRiche has reported, yet in some of them the results are excellent. Since the operation is innocuous and easy of performance, it is well worth a trial.

Kramer and Todd[28] have shown that the sympathetic innervation of blood vessels enters from the spinal nerves at different levels, so that anatomically and physiologically the LeRiche operation is not on a very firm basis. We feel that a more extensive operation is necessary in most cases and reserve the LeRiche type for those in which the major ganglionectomy is not justified.

### GANGLIONECTOMY IN VASOSPASTIC DISEASES

In this phase of sympathetic surgery Adson has been a pioneer and many of the advances have come as a result of his work. He has reported excellent results in Raynaud's disease,[29] some cases of Buerger's disease[30] (those in which there is a vasospastic element) and in scleroderma.[31] At present he is doing some work on malignant hypertension.[32]

### GANGLIONECTOMY IN POLYARTHRITIS

In 1926 Rowntree[33] suggested ganglionectomy for those hopeless arthritics who go on to disability despite all treatment. Adson[34] has reported six cases with excellent results. We[35] have done four cases with good results, one case, however, dying of postoperative pneumonia. The operation gives immediate relief of arthritic pain and an immediate increase of joint function which is progressive (fig. 8).

### HIRSCHSPRUNG'S DISEASE

Judd and Adson[36] and Wade[37] report cures of Hirschsprung's disease by removal of the second lumbar sympathetic ganglion on the left side, and it is now their practice to treat all cases in this manner rather than by removal of the colon.

### SPASTIC CONDITIONS

You are all familiar with Hunter's[38] and Royle's[39] work on ramisection in cases of spastic paraplegia. Royle[40] is now getting excellent results in the relief of the tremor and spasticity in the parkinsonian syndrome by sympathetic ramisection, and has also applied this operation to cases of spastic hemiplegia with good results.

We look for great advances in the field of sympathetic surgery. W. J. Mayo has been quoted as saying that surgery of the future is the surgery of the sympathetic nervous system.

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# ACTIVE IMMUNIZATION AGAINST DIPHTHERIA

## A PLEA FOR STATE-WIDE APPLICATION IN IDAHO*

T. A. Ellison, M.D.
ST. ANTHONY, IDA.

Because of the nature of Idaho State Industrial School, with which I am connected, the matter of contagious disease is one of our concerns. Along this line we have done some work in active immunization against diphtheria, and I shall concentrate on this general subject.

The medical man who sees disease and treats it to a point of recovery is an asset to the community, but one who prevents a disease is a greater asset. He prevents suffering of the individual, expense due to illness and loss of time, and in the case of communicable disease he protects people other than his patient from danger due to its spread. In addition to all this, his patient is certainly as well off as the fellow who was cured, and usually better.

Important achievements along this line in the case of yellow fever, malaria, typhoid fever, typhus fever and others have been made by members of our profession. These have been accomplished usually because of the stress of economic urgency. Prevention of diphtheria seems to have lagged behind possibilities, although theoretically we have developed more complete control of this than of any other disease, having developed a test for susceptibility, means of passive and active immunization, and the curative treatment.

With all these at our command, if we cannot control diphtheria, what more would we need, and what disease could we control? Possibly the fact that we have a curative treatment is partly responsible for this indifference to prevention. But our efforts at cure are not all successful. Deaths from diphtheria, regardless of our varied means of defense, are generally admitted entirely too frequent.

Seventy-eight cities in this country reported 2,682 deaths in 1929. Our state reported only twelve. Why, then, the concern, one might ask. The answer is that, in spite of our highly successful means of treatment, these twelve deaths occurred in only eighty-two cases, and the low figures are simply a matter of luck for the majority of our people are susceptible, and luck will not always be with us.

And, furthermore, the time to apply this preventative measure is before incidence of the disease is imminent. For it is a well-known fact that the development of immunity requires from two to six months of time. Failure to apply our knowledge of the prevention of diphtheria is due chiefly to our free and easy American custom of living today, and leaving tomorrow's worries for tomorrow's consideration, and so we wait until an epidemic is upon us to apply methods which, to be effective, must be applied months before.

Cumming in 1922 compared results of diphtheria control in 1920 with those of 1890 under the title, "Is Diphtheria Control Leading to Eradication?" (*J. A. M. A.*, 78:630, March 4, 1922). He reports in that time the saving of millions of lives in this country by antitoxin, but at the same time about 3000,00 deaths and no reduction in incidence. He calls attention to the very important fact that cure by antitoxin increases the number of healthy carriers without the danger signal symptoms which makes additional vigilance necessary. To quote him further, "If this vigilance is to be a matter of general active immunization, thirty-one millions of children then living, (and the number at the present time is nearly that) and two million born each year would have to be immunized. Presumably this is not possible, and if it were, is it advisable to undertake this scheme with a view to applying it year after year?" "And," he goes on, "the active protection would no doubt be more or less limited to the larger and better organized communities, making of them, because of the increased carrier problem, reservoirs of distribution of diphtheria organisms to the rest of the population."

That certainly is just what would happen, but Cumming admits that case incidence has not by other means been reduced. So is not his own contention an argument for the widespread use of immunization rather than against it? Otherwise, he would permit the people of the larger centers to go on developing diphtheria in order to protect the smaller communities from carriers, and such a system would be unfortunate, for he says fifteen thousand lives were annually lost under it, and carriers would be at least as numerous. In conclusion he says, "The eradication will not come through serum treatment, immunization of the well, nor accurate diagnosis of case and carrier, followed by quarantine, but rather through mass sanitary protection of the populace, subconsciously practised by the people at all times." Just what he means by that is not quite clear to me, nor does he tell how to attain that desirable popular practice.

It is certainly clear that serum treatment, while saving lives, does increase the number of healthy carriers, and detection and treatment of these is a very difficult undertaking. It is also true that people in general, including children, are now subconsciously, as he says, refraining from trading chewing gum, placing others' pencils and such things in their mouths, finishing the consumption of a partly eaten fruit and so on. But it also seems to me that many of them have substituted drinking from the same bottle, going further and more frequently to dances, crowding together in movies, and in many other ways increasing close personal contact, even to the extent of promiscuous kissing, which I am told is at least as prevalent as before. And by what means are we going to stop all of that? This subconscious practice of mass sanitary protection, as I understand it, seems to have fallen down as a solution, and so far as I can find, we are left to depend upon the method which he rejects, namely, general active immunization. Let us, therefore, consider it.

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* Read before the Thirty-eighth Annual Meeting of Idaho State Medical Association, Coeur d'Alene, Ida., June 27-28, 1930.

For this purpose we have available toxin-antitoxin, anatoxin and toxoid. In the United States and Germany the first chiefly is used. In France Ramon's anatoxin (toxin modified by warmth and the addition of formalin until it becomes practically nontoxic) is usually chosen. In England and Canada toxoid (toxin modified by the addition of less formalin than in the case of anatoxin, leaving it relatively toxic) is favored. Ramon maintains that anatoxin produces immunization more rapidly (three to six weeks) than toxin-antitoxin, but Park found no appreciable difference. In general, reports seem to indicate no great difference in prophylactic value among these.

There are some who object to the use of any of these for various reasons, chiefly, first, expense; second, fear of serum sensitization; third, fear of ill effects; fourth, doubt of effectiveness of active immunization attempts; and, finally, magnitude of the undertaking. None of these reasons is valid for, first, the whole family can be immunized for less than the cost of treating one case; second, men who have done much work along this line (notably Park and Schroder in New York) have not found evidence of sensitization from the small amount of horse serum used, and even if such were the case, other serum, such as goat or sheep can be and is now being substituted. Third, only three reports of major trouble have been made, and each of these was clearly shown to have been due to avoidable accidents.

In Dallas, Texas, a number of deaths occurred from the use of a preparation of toxin-antitoxin, in which the toxin was not properly neutralized. This blunder certainly will not be repeated by manufacturing houses. In Vienna, Austria, dilute toxin was carelessly used in place of the nearly completely neutralized toxin with a number of deaths following. This, of course, is avoidable. In Queensland, Australia, a bulk preparation not containing an antiseptic was repeatedly used. The deaths afterward proved to be due to staphylococcus infection from organisms accidentally or carelessly introduced into the serum where they were abundantly cultured. Thi sorganism was recovered from both the preparation used and the patients (*J. A. M. A.*, 91:262, July 28, 1928). All preparations now made contain enough antiseptic to prevent a repetition of such trouble. It has been found that freezing toxin-antitoxin preparation of the older type temporarily separated enough free toxin to give trouble. This difficulty is, of course, avoidable, by proper temperature regulation, and, furthermore, in the newer one-tenth L plus mixture, now in general use, it does not occur.

On the other hand, we have reports of hundreds of thousands of cases without any serious ill effects. In August, 1928, more than thirty thousand were so reported in France, sixty-six thousand in Belgium, forty thousand in Canada. (*J.A.M.A.* 92: 403, Feb. 2, 1929). In New York, Park and Schroder in hundreds of thousands of cases never had any ill effects of consequence. In about four hundred cases in my work no ill effects sufficient to be called to my attention have followed.

Now as to effectiveness. In this country Park and Zingher in New York have been the outstanding leaders in diphtheria prevention, using both toxin-antitoxin and anatoxin. By the Seventh Annual Report on diphtheria mortality (*J.A.M.A.*, June 7, 1930) we find that in their city in 1929, 462 deaths from this disease occurred, but had the average rate of 1895 to 1899 prevailed, the number would have been approximately five thousand, or more than ten times as many. Of course, part of this reduction is due to improved treatment, but most of it must have been the result of prevention, for the mortality rate, you will remember, is still more than 10 per cent and antitoxin had been in use since 1891.

From Virginia, in 1927, comes the report of the use of toxin-antitoxin in 147,000 children, with a general reduction in incidence following in that state, contrasted with an increase in the same time in the United States as a whole (*J.A.M.A.* 91: 1045, Oct. 14, 1928). San Joaquin County, California, put on a campaign of active immunization over a period of several years, and reported in January, 1928, not a single death in three years following (*J.A.M.A.* 90:122, Jan. 14, 1928). Auburn, New York, had a clean record in this respect for four years, following active immunization, until it was broken by a case in an unimmunized child (*J.A.M.A.* 90:624, Feb. 25, 1928). France, Germany, Belgium and England furnish similar reports of effectiveness with respect to campaigns of active immunization.

As to the duration of immunity once established, not only in the case of diphtheria, but in any other disease, this is a matter about which no individual can be certainly sure. As an example, a lady in my home town had a local reputation as one immune to smallpox, and therefore had been for twenty-five years the nurse par excellence in that disease. But one day after her long experience she became ill and soon showed the most typical and most severe case of smallpox I have ever seen. Either she had never before been inoculated during her frequent exposures, which is highly unlikely, or she had lost an immunity once possessed. It seems entirely likely that this loss of immunity is not an infrequent occurrence, and is illustrated by second attacks of diseases which usually confer lifetime immunity, such as typhoid, and is certainly the case in illness such as influenza, pneumonia and other conditions which regularly may occur repeatedly.

In the case of diphtheria, fortunately a person's state can be determined by the Schick test. Reports by Park and Schroder in twenty-five infants and young children immunized in 1919, show twenty-three still negative in 1926, 92 per cent having retained immunity for eight years. One hundred and seventy-eight adults, giving positive tests and immunized in 1920, when retested eight years later showed 62 per cent still immune and an additional 19 per cent possibly so (*Practical Medical Series,* p. 126, 1929). In the absence of reports on larger numbers, it seems these figures may be accepted as a reliable guide. The same authorities say that children seem to hold acquired immunity better than adults.

It is in general true that susceptibility to diphtheria is low in babies under six months of age. From that time on it rapidly increases up to four or five years and then gradually decreases. Approximately 50 per cent of adults are naturally immune. Because of this condition preventive efforts are especially needed for children of preschool and school age groups. Schick testing of these children is of little practical value. All may be considered positive. In adults and those previously immunized it is of value in determining who are in need of preventive treatment as a public health measure. In a preventive campaign all preschool and school children and all susceptible adults should be immunized by the use of toxin-antitoxin or anatoxin. In the case of the use of either of these, however, production of immunity should not be assumed, but should be proved or disproved by test, and sufficient time should elapse between treatment and test to permit the development of immunity.

*Magnitude of job.* One might expect the execution of a procedure involving the majority of the population to require considerable time and effort. However, Schick testing and administration of toxin-antitoxin can be done with comparatively little of either, when properly planned. Since young children are most susceptible, this could best be done in clinics for (1) school children, and (2) those of preschool age. Neither of these would require Schick testing at first. Adults could be met at separate sessions, first, for testing, and five to seven days later for checking test results and the administration of the first toxin-antitoxin to those showing positive reactions.

From my work at the school I find that people can be handled in this way at the rate of three per minute. There are about 4000 adults in Fremont County. The five physicians there could at this rate test them in three and a half hours. Another session of that length of time would suffice for reading tests and administering the first preventive dose which only about half would need, and two other sessions of perhaps two hours each would finish this group. Therefore, the adults could be completely dealt with in eleven hours and need not be seen again for six months, when each positive should again be tested, and likely a few retreated. The children could be dealt with in four sessions of six hours each. This means a total of about thirty-five hours time and would close the matter for six or eight years, except for children born each year. A few would lose immunity, but with so few susceptible the disease would appear very rarely indeed. The work in the remainder of the state could be equally easily done.

I am ready to admit that consummation of the above program would require cooperation on the part of the public as well as among the medical men. That means a campaign of education. Who shall do this? In the Diphtheria Mortality Report (*J. A. M. A.*, 94:1838, June 7, 1930) we find this statement: "Diphtheria, like typhoid, is a preventable disease, a fact that every municipal chamber of commerce ought to know." Well, chambers of commerce don't read the *Journal of the A. M. A.*, and if they did, should we leave initiation of these matters to them? Too much outside interference is already leading toward so-called state medicine which, as I see it, is roughly the public's attempt to supervise its health conditions, when the medical profession fails to do so.

Nor did chambers of commerce develop our present favorable conditions with reference to typhoid. That was done by the medical profession through persistent individual and cooperative educative effort with patients and through public educative drives by state boards of health. It was by teaching, and I firmly believe that physicians owe the public this educative effort, for every individual gets far more from society than he could ever return. I would then propose the following two-part plan:

1. An intensive educative campaign planned by this society but conducted by the Idaho State Board of Health through school boards, parent-teacher associations, churches, chambers of commerce and any other civic bodies as deemed advisable, setting forth:

a. The fact that diphtheria, while not now prevalent, is a probable menace to purse, health and life.

b. That all this is unnecessary for the disease is preventable.

c. That preventive measures are effective for a long period of time and harmless.

d. That cost of preventive measures is very low compared with the cost of treatment (in Virginia 147,000 were treated for $35,000 publicly, or about 25 cents each).

e. That the expense of prevention should be taken care of by the individual.

f. That the time to prevent this disease is when it is not prevalent.

g. A tentative date for beginning concerted action.

2. Full cooperation of medical men of this state through their local societies in the execution of the above proposed campaign by the State Board of Health for general immunization against diphtheria.

## TREATMENT OF CARDIAC IRREGULARITIES*

WILLIAM J. KERR, M.D.
SAN FRANCISCO, CALIF.

Abnormal rhythms resulting from structural and functional disturbances in the heart offer many problems for the physician. He is almost daily called upon to interpret such disturbances and to prescribe adequate treatment. It is not my purpose to discuss at length the methods of differentiating these irregularities, one from another, but to speak of some practical methods of treatment which have been of value in my own experience.

In the following classification will be found practically all the recognized types of irregularities. Some of these are rare and require few comments. For others we have as yet no satisfactory methods of treatment, or they are incidental in the dying heart.

CLASSIFICATION OF CARDIAC IRREGULARITIES

Sinus arrhythmia
Sinus tachycardia and bradycardia
Sinoauricular block
Auricular extrasystoles
Auricular paroxysmal tachycardia
Auricular flutter
Auricular fibrillation
Nodal extrasystoles
Nodal tachycardia
Reciprocating rhythms
Ventricular extrasystoles
Ventricular paroxysmal tachycardia
Ventricular fibrillation
Delayed auriculoventricular conduction or partial block
Complete heart-block
Bundle branch block
Arborization block
Pulsus alternans

*Sinus arrhythmia* is the most common of all the irregularities of the heart. The rhythm is disturbed by influences outside the heart, the rate varying periodically, and usually with the phases of respiration. It is most common in children and in young adults, and is often seen after infections. It is frequently associated with extrasystoles in young adults, and is of no clinical significance. When interpreted as a serious disorder it has been a cause of unnecessary alarm to the patient. No treatment is indicated.

*Sinus tachycardia and bradycardia* are also common. The normal range of the heart rate is from 40 to about 100 per minute. Rates lower than 40 per minute have been observed in the heart with a normal mechanism; and rates above 100 per minute are observed after exercise, during infections and with such toxic conditions as thyroid disease. There is no specific treatment in either case. Tachycardia of this type does not call for digitalis in the absence of signs of congestive heart failure.

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* Read before the Thirty-eighth Annual Meeting of Idaho State Medical Association, Coeur d'Alene, Ida., June 27-28, 1930.

* From the Department of Medicine, University of California Medical School, San Francisco, California.

*Sinoauricular block is uncommon.* There may be sudden attacks during which the heart rate is halved, or periods of standstill of the entire heart. Atropine may be of value.

*Auricular extrasystoles* are among the most common of the irregularities. They may or may not produce symptoms. The impulse arises in the auricle outside the normal "pacemaker," leading to premature contraction and disturbing the rhythm of the entire heart. In most cases they appear to be of little clinical significance; but many times they are the forerunners of auricular tachycardia, auricular flutter or auricular fibrillation. Recent investigations by Brow and Fulton suggest that central influences may play a role in initiating these irregularities. They are often associated with indulgence in tobacco, alcohol or other toxic substances; or are related to foci of infection or indigestion. Removal of such factors may control these irregularities. If they produce symptoms, temporary relief may be obtained by quinine or quinidine compounds. A dose of 2 to 3 grains of quinidine sulphate four times a day may be of value.

*Auricular paroxysmal tachycardia* is a common cause of repeated attacks of palpitation, where the whole heart beats regularly at the rate of from 170 to 280 per minute. The rhythm is regular. The symptoms may be marked. The onset and offset are sudden. Usually there is a history of attacks over many years. The duration may be from minutes to days. The patient frequently employs some method to stop the attacks, as deep breathing, exercise, bending forward, leaning over a chair, pressing on the neck or by the induction of vomiting.

In practice all of these methods and others which stimulate the vagus may be tried. Pressure over the globes of the eyes may stop the attack, but this is often painful for the patient. Vagal pressure on either side usually will be successful. Some experience is required to secure the best results, which are often spectacular and bring the gratitude of the anxious patient and family. When all such attempts fail, as it will in a small percentage of cases, one may try quinine or quinidine. We have had good results with quinine dihydrochloride in solution, giving the drug slowly into the vein. Usually before 5 or 7 grains are given, in a period of ten to fifteen minutes, the attack will cease. The usual dangers of quinine idiosyncrasy should be kept in mind when giving these drugs intravenously. As a preventive for the attacks of tachycardia, quinidine sulphate should be given four times a day in doses of from 1 to 3 grains, if the attacks are frequent. The prognosis is excellent.

*Auricular flutter* may be paroxysmal or permanent. The auricles beat regularly at a rate of from 270 to 350, and the ventricles respond with a varying degree of block. The ventricular rhythm may be regular or irregular. The ventricular rate, without treatment, varies from 100 to 170 per minute. Vagal presssure will slow the ventricles. In this type of irregularity cinchona compounds have been of little value in my hands. The usual and most satisfactory method of treatment is to put the patient to bed and give digitalis in full doses, increasing the auriculoventricular block. Sometimes the ventricular rate may fall to 40 per minute before the auricular flutter changes to auricular fibrillation. Then the digitalis is withheld, and frequently the normal rhythm will be promptly restored. If this result is not obtained, quinidine may be given in doses up to 6 grains every four hours, day and night. Thereafter small doses of quinidine may be of value in preventing a return of the abnormal mechanism. This type of arrhythmia is frequently associated with serious valvular or degenerative heart disease, and one may profit little from treatment directed toward the irregularity alone.

*Auricular fibrillation* may also be paroxysmal or permanent. This disturbed mechanism is usually associated with serious heart disease and is well known to all physicians. Paroxysmal attacks may precede the permanent disorders by many years. It is not infrequent in toxic thyroid states and is the usual cause of true palpitation in this disease. With congestive heart failure we have a combination of circumstances which demand prompt relief. Digitalis has for long been the sovereign remedy in this disorder. Its value is so well known that it would seem unnecessary to enter into any discussion here about its use. In recent years we have learned more about the indications for the drug; we have learned to rely on standard preparations; and we have learned that we can get more prompt results by giving larger doses.

One of the greatest errors in modern practice is to rely on the tincture, and to administer it with the ordinary medicine dropper, on the mistaken assumption that one drop of the tincture is equivalent to a minim. Droppers vary greatly and may deliver from 35 to 65 drops to the 15 minims. A dose of from 10 to 15 drops three times a day could scarcely be of any value to the patient. Unless a graduate glass or a measured dropper be used, we should rely on the dried leaf made up in the form of capsule, pill or compressed tablet. The digitalis should then be given as originally employed by Withering, until the pulse is slowed, diuresis occurs or toxic symptoms make us stop. The treatment is then continued with maintenance doses with proper rest, limitation of activity, reduced salt intake, restricted fluids and other well known measures.

In the paroxysmal attacks of auricular fibrillation good results may be obtained by the use of quinidine sulphate in doses of from 1 to 3 grains four times a day, and with an extra dose during the night if necessary. In thyroid disease the attacks are not readily controlled unless the goiter is also treated. In the more permanent type of auricular fibrillation, quinidine compounds have been of great value. They should probably not be used in the presence of congestive heart failure, until the compensation is restored, or in the extensively damaged heart. In such cases the abnormal rhythm would tend to recur and here digitalis would be a more suitable drug.

In patients who have fair cardiac muscle, and who have had auricular fibrillation for months or years, the normal mechanism may be restored in a high percentage of cases. Our results have been very gratifying, when cases are carefully selected for trial and when the drug has been properly given. After a small test dose of 2 grains, with the patient in bed, *the drug is continued every four hours, day and night,* for as long as a week if necessary; and the size of the dose may be gradually increased also, if no results are obtained after the second day, or if no toxic symptoms develop. Sometimes patients are more uncomfortable with a regular rhythm if the heart rate is high; or it may be necessary to continue the drug in small doses for an indefinite period to maintain a normal mechanism. Each case must be decided on its own merits.

*Nodal extrasystoles, nodal tachycardias and reciprocating rhythms* are uncommon, and I am not prepared to say from experience how best to treat them. Cinchona compounds may be of value, but have often failed. Digitalis does not seem to be of much use except in patients with associated congestive failure.

*Ventricular extrasystoles* are very common arrhythmias. The premature beat in the ventricle, however, does not disturb the underlying rhythm of the heart. They are seen commonly in young persons and often in older persons with and without obvious cardiac disease. Often they are forerunners of more serious types of irregularities. They are frequently disturbing to the patient. Whether central influences play a role is not certain, but the same systemic conditions predispose to them as given under auricular extrasystoles. These factors should be investigated and controlled if possible. Drugs such as quinidine seem to have little value in this group. Digitalis is not indicated when the irregularity exists alone. Potassium salts may find a place here after further trial. When ventricular extrasystoles arise from several foci, they are of great prognostic significance and indicate serious myocardial damage. They may be forerunners of *ventricular tachycardia and ventricular fibrillation.* At present we have no adequate treatment for these two latter types of irregularity. Recent studies by two members of my staff suggest that potassium salts may aid in preventing or treating these disturbances in rhythm.

The various types of so-called heart-block are commonly observed in cases of serious heart disease. The impulse from the auricle may be interrupted at any point from the auriculoventricular node to the ventricular muscle, resulting in *partial, complete block, bundle branch block, or arborization block.* The conduction time may be prolonged with each impulse, the block may be progressive with succeeding beats until the ventricle fails to respond, resulting in a dropped beat of the ventricle, or there may be complete dissociation between the auricles and ventricles, with independent rhythms for the two parts of the heart. The complete block may be intermittent, giving us the clinical picture of Adams-Stokes syndrome. Block in a branch of the bundle of His may be temporary or permanent. If the disturbances are due to syphilis of the heart or to local circulatory changes, some benefit may be derived from general measures. Theobromin compounds may improve the circulation of the heart. Atropine may remove to some extent the action of the vagus in partial block. Adrenalin and barium compounds may also be of value in increasing the irritability of the heart muscle and conduction system.

*Pulsus alternans* is rather an irregularity of force of contraction than an irregularity of rhythm. It is observed in the toxic heart of infections and in late cases of cardiovascular renal disease. It indicates a grave prognosis. Rest is most important, and other general measures which are indicated are to be considered.

These few comments do not by any means exhaust the subject, but indicate some of the measures which may be found most useful in the treatment of irregularities of the heart.

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# PANCREATITIS *

Andrew Stewart Lobingier, M.D., F.A.C.S.
LOS ANGELES, CALIF.

Since the scientific study of acute infections of the pancreas by Senn, Fitz and Opie in the late '80s and early '90s in this country, and the outstanding lecture at the London Polyclinic in 1900 by Mayo-Robson, the pathology and treatment of pancreatitis has elicited the interest of surgeons throughout the world.

From the first the fact has been recognized that these infections were of bacterial origin and it is interesting to note that as early as forty years ago Robson suspected this infection to arise from remote foci ("extrinsic causes") and named "biliary and pancreatic lithiasis, ulcer of the stomach, pylorus or duodenum, typhoid fever, mumps and influenza to be determining factors." To these Rosenow in recent years has added apical abscesses in teeth, follicular tonsillitis and sinusitis. Graham and Mangeret have shown that infection of the liver through the portal circulation was carried to the pancreas through the lymph channels in the same manner as this infection is conveyed to the gallbladder, and that any remote focus infected with pyogenic organisms may be the source of this infection.

Opie, working with Halsted, found that an obstruction of the common bile duct at the ampulla of Vater by a small gallstone would cause a damming back of bile into the duct of Wirsung, causing a pancreatic cholangeitis. Mayo-Robson reported a number of cases in which there were large, and in several cases multiple, stones in the common duct associated with pancreatitis. This infection of the pancreatic ducts assumes the presence of pyogenic bacteria in the bile. For it is a well known fact that this pancreatic cholangeitis is commonly associated with a biliary cholangeitis. Moreover, the bacteria generally found present in infection of the pancreas are similar to those found in biliary cholangeitis—bacillus coli, staphylococci and the green streptococci.

It is well to remember that, whilst the primary center of infection is the liver, the sequence of this infection is vastly graver in its fulminating character in the pancreatic than in the liver ducts; and owing to the potent character of the trypsin in the pancreas, the rapidly forming intense edema in the parenchyma of the pancreas passes rapidly on to necrosis.

The pathogenesis of pancreatic infections must, therefore, always assume the highest importance in the study of the destructive changes in this hidden organ. We can no longer study the pathology of pancreatitis independently of liver and gallbladder infection. The early observation by Mayo-Robson of edema of the head of the pancreas, simulating in some of his cases carcinomatous tumor in septic infection of the gallbladder, has directed us to the inspection of the pancreas in all such infections. This edema is most marked in the head of the pancreas and is a definite and very constant response to the infection which has been transmitted to it from the liver.

In describing the pathologic changes that occur in infections of the pancreas the earlier writers were guided by what was found at autopsy or operation. These appearances led to a series of classifications which are now regarded as but stages in a progressive destructive pathology, which if not arrested may go on to mass necrosis.

Following the edema which results from the infection the active pancreatic ferment, lipase, splits the fat into stearic acid and glycerine, and the union of the salts of calcium with the changed fat globule produces an opacity which has been called fat necrosis. This was described by Balser as early as 1882. Just how this lipase gets out into the fat in the mesentery and omentum has not been determined, but probably it is carried by the lymphatics. Whenever these opaque areas are present, they indicate infection of the pancreas and inflammatory and degenerative changes in the gland.

Some authorities are of the belief that fat necrosis is not infallible evidence that the pancreas had been infected, but the majority of clinical surgeons regard this as so commonly an index of change in the pancreatic ferment that suspicion of edema and other inflammatory phenomena are always imminent. When this edema is associated with rapid chemical changes in the pancreatic secretion, the process may go on to necrosis and abscess. The destructive change may be so rapid as to cause the necrotic areas, which at first were small loci, to coalesce and form a great liquifying necrotic mass, involving a large portion of the gland. This is a true gangrene or mass necrobiosis and is due to a sudden cutting off of the blood supply, plus the destructive self-digesting action of the pancreatic ferment.

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* Read before the Eighth Annual Meeting of Pacific Northwest Medical Association, Butte, Mont., July 1-3, 1930.

Where the chemical action eats through an important blood vessel wall, a large hemorrhage will occur. Smaller vessels may be eaten through in various portions of the gland and, if the edema and infection continue, they may become confluent and form a large blood cyst. In case they persist as single and discreet blood clots, eventually they will remain as cysts. These blood cysts are not to be confused with retention, proliferation or with pseudocysts. If the infection has not gone on to mass necrosis or large destructive hemorrhages, it may subside and leave a chronic inflammation, which may persist for years with periods of recrudescence and subsidence, resulting in deposition of connective tissue and a pathologic condition akin to hepatic cirrhosis.

A case of this character is recalled with a long history of septic cholecystitis, in which the succession of attacks had covered a period of years, with a gradual failing of the myocardium. This patient had had a cholecystectomy for hydrops eighteen years ago and had remained well for twelve years following the operation. For the past six years she has been an invalid from chronic pancreatitis.

The diagnosis of pancreatitis may be difficult, especially in an acute fulminating seizure where the anamnesis cannot be adequately obtained. There will be generally a history of digestive disturbances such as are seen in the typical cases of cholelithiasis with cholecystitis. Acute perforation of the duodenum or stomach, gallstone or kidney stone colic, mesenteric thrombosis and other critical signs common to acute upper abdominal conditions need to be thought of.

An overwhelming pain, requiring a narcotic often before a correct diagnosis can be made, is characteristic of the acute seizures. The pain may be so severe as to cause complete collapse. In other cases it is paroxysmal with intervals of relief. There is marked abdominal rigidity above the umbilicus, tenderness over Robson's point, and if there has been a hemorrhage, it is sometimes possible through the board-like rigidity of the abdominal muscles to detect a tumor mass.

The leucocyte count is usually lower than in mesenteric thrombosis. The evidence of shock may be quite as marked as in acute perforation. The pulse is rapid, small and of poor quality, the skin is pale and cold, and the temperature may range from 100° to 104° F., according to the virulence of the infection and rapid destruction of parenchyma of the gland. As a rule the facial expression is anxious and shocked as in acute perforation of the stomach or duodenum.

Nausea and vomiting are commonly present in the acute fulminant infections. Paresis of the gastric and intestinal muscularis from the extreme toxemia results in more or less marked abdominal distension. In many cases there is a slight icterus from common duct obstruction. In the beginning the patient is constipated but, if he survives a few days, a diarrhea may develop with fat, blood and pus in the stools.

The symptoms in subacute pancreatitis are obviously less critical and fulminant. For this reason more time may be taken in arriving at a differential diagnosis. Instead of acute and paroxysmal pain in the epigastrium the patient complains of a heavy intraabdominal weight and is tender on pressure above the umbilicus. If an abscess develops, there will be a corresponding rise of temperature and pulse rate with rigors and the rigidity and tenderness which accompany localized peritonitis. Loss of weight from sepsis and diarrhea and impaired digestion and loss of fat are characteristic of pancreatic abscess or necrotic change in the parenchyma.

In chronic inflammation of the pancreas there is a slow infection from the backing up of septic bile into the pancreatic ducts, and also through the lymphatics draining from the liver. This is followed by inflammation in the fibrous reticular framework of the gland, and by round cell infiltration and proliferation of connective tissue cells. This slow hyperplasia terminates in contraction around the secreting parenchyma, and the islands of Langerhans may wholly or in part perish. There is usually a mucopurulent discharge coming from the two ducts and discharging into the ampulla. If this infected secretion is held up, a slowly forming single abscess may result, or small multiple abscesses may arise in different portions of the gland, and give rise to symptoms not unlike those in subacute pancreatitis with abscess.

Glycosuria is not a usual concomitant of acute or subacute pancreatitis. Occasionally it is met with in chronic pancreatic cirrhosis, where the islands of Langerhans are affected.

The principle of treatment of pancreatitis in all its forms and destructive changes is early surgical intervention and drainage. There is no form of acute abdominal infection, in which greater skill and judgment is required in establishing a drainage which is adequate and efficient, and in which the neighboring viscera are protected from infection. Abscesses, hemorrhagic and necrotic cysts and lacunae must be evacuated, sponged out and drained. The most judicious selection of anesthesia, in order to avert shock, is essential.

When the patient has sufficiently recovered, the offending gallbladder and bile ducts should be inquired into and, insofar as possible, the source of infection in these structures and in remote foci should be removed. In considering the various forms and degrees of infection of the pancreas, one is impressed with the responsibility associated with neglected infections of the various foci, including the liver and ducts, which if corrected in time would have averted these tragic hazards.

We should be patient and forbearing with the reiteration of the details of this pathology, because of the grave consequences which are inevitable if we ignore them. We should welcome any contribution which will lend emphasis to the pathogenesis of a disease so insidious and lethal in its issues, so dramatic in its devastating destruction.

### SUMMARY

1. All infections of the pancreas arise from the liver and gallbladder and more remote septic foci.

2. The initial pathologic change is ushered in by cloudy swelling and edema of the parenchyma.

3. There is a growing conviction that the older classifications of pancreatic infection are but stages in a progressive pathologic change, the degree and intensity in which will determine the nomenclature.

4. The treatment is competent drainage, with removal of as much necrotic material as possible, and later, if the patient survives, the investigation of infecting foci.

Merritt Building.

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# DIABETES

## A SUMMARY OF PRESENT-DAY KNOWLEDGE

I. C. Brill, M.D.
PORTLAND, ORE.

Clinically there may be observed two varieties of diabetes, the acute or severe, and the chronic or relatively mild form. The acute generally occurs in youthful and undernourished individuals; the chronic is usually seen in the older, relatively well-nourished patients. The essential difference between the two types is the degree of metabolic injury present. In the acute variety the metabolic disturbance is sufficiently severe to render it exceedingly difficult if not impossible, even at a very early stage, to enable the individual to metabolize completely an adequate maintenance diet without the aid of insulin. On the other hand, a diabetic of the chronic type, if seen early after the onset of symptoms, may generally, with comparative ease and without the aid of insulin, be rendered free from diabetic symptoms upon an efficient maintenance diet.

### PATHOLOGIC PHYSIOLOGY

The essential physiologic disturbance is an insufficiency of the insular function of the pancreas. This may or may not be accompanied by demonstrable anatomic changes in that organ. On account of the inadequate supply of insulin, sugar cannot be properly utilized and is accumulated in the blood in abnormal amounts. In the absence of a sufficient amount of available glucose, the fats are incompletely burned, resulting in the formation of beta-oxybutyric acid and other abnormal end-products. The result of this physiologic disturbance is the "clinical triad" which characterizes diabetes —hyperglycemia, glycosuria and acidosis.

### ETIOLOGY

Much has been written on the subject of etiology of diabetes, and such factors as obesity, heredity, chronic and acute infections, disease of the biliary system, and arteriosclerosis have received due attention. It is assumed that the pancreas is weakened anatomically and functionally, or functionally alone, by one or more of these factors. The proof upon which this assumption is based is of the indirect sort, largely in the nature of statistical data.

More direct evidence is available concerning the nature of the cause of the immediate outburst of symptoms. Allen has demonstrated both by animal experiments and by clinical observations, that given a weakened pancreas, symptoms of diabetes are readily induced by any measure which will cause an excessive increase in the general metabolism, thus throwing an extra burden on the pancreatic function. It may, therefore, be stated authoritatively, that, whatever may have been the factors concerned in the primary weakening of the pancreas, the immediate cause of the onset of diabetes in a given case is an overstraining of the pancreatic function. This concept is important, as it constitutes the rationale for the modern treatment of diabetes.

### PATHOLOGY

It has already been stated that the chief seat of trouble is located in the pancreas. The "beta" cells of the islands of Langerhans are especially involved. It is interesting to note, however, that cases of typical clinical diabetes have come to autopsy, in which no anatomic changes could be demonstrated in the pancreas. The lesions in the other organs are generally the result of an arteriosclerosis which is usually seen in any diabetic of long standing, regardless of age.

### TREATMENT

The aim of the modern treatment of diabetes is to secure the greatest possible amount of pancreatic rest. This is accomplished by reducing the metabolism to the lowest possible level, taking the following factors into consideration.

1. Rest. In regulating the patient's activity, consideration is given to severity of the disease and to the physical and economic status of the patient. From absolute rest to normal activity is prescribed in accordance with the acuteness and severity of the disease, and the stage of the treatment. At the onset of the treatment more or less complete rest is enforced, but a greater degree of activity is permitted as the patient's tolerance for food is increased.

2. Weight. Excessive weight obviously increases the caloric requirement, thus throwing an excessive burden upon the pancreas. On the other hand, decided undernutrition renders the patient too weak for ordinary mental and physical work. It is, therefore, desirable to maintain a weight level just at or only slightly below the average for the sex, height and age of the patient. The desired change, however, should be brought about very gradually over a period of weeks or months.

3. Diet. The aim is to supply an adequate number of calories for the patient's needs but not in excess. Furthermore, the calories must be derived from protein, carbohydrate and fat in proper proportions, in order to keep the individual in nitrogen balance, and to avoid ketogenesis. Such a diet is designated as "an antiketogenic maintenance diet" and is the ultimate goal aimed at in the management of any case of diabetes, regardless of type. However, the methods of attaining to that goal vary with the type and severity of the disease and with the condition of the patient. In general it may be stated that the acute, undernourished patient is allowed a maintenance diet at the outset, and desugarization is accomplished by the use of insulin.

The chronic, overnourished diabetic is given a subbasal diet, the double objective being desugarization and loss of weight. When desugarization is accomplished and the desired loss of weight achieved, food is gradually added until a maintenance diet is reached. In this variety of the disease insulin is rarely necessary.

Various modifications of this general plan become necessary in accordance with the indications in special instances. Complications, such as acute infections, surgical operations, or any condition which imposes an extra burden upon the general metabolism, immediately call for a more liberal diet with the free employment of insulin.

### THE ANTIKETOGENIC MAINTENANCE DIET

It is no exaggeration to state that the dietetic management is still the most important part of the treatment of diabetes. It seems, therefore, advisable to discuss at some length the construction of the antiketogenic maintenance diet. The factors to be considered are the total calories in the diet, the protein requirements and the fatty acids-glucose ratio.

1. The Total Calories in the Diet. The total caloric requirement of any individual equals his basal requirement plus a sufficient number of calories to supply the energy consumed in his extrabasal activities. The basal requirement may be regarded as a constant for any given age, sex, height and weight. The extrabasal factor varies with the age and activities of the patient. The more youthful and active the individual the higher the value of the extrabasal factor. The actual figures can only be determined by trial and error, but roughly it may be stated that the total caloric requirement varies from basal plus 30 per cent to basal plus 75 per cent in adults, and basal plus 30 per cent to basal plus 100 per cent or more in children. A conservative estimate must be made in any given case, and the correctness of the estimate is determined by the progress of the patient. If after the lapse of a reasonable period of time the individual is able to carry on his duties, maintaining his

nutrition at a favorable level, the total calories in the diet may be regarded as adequate. On the other hand, in the event of unfavorable developments, corrections can readily be made according to indications.

2. The Protein Requirements of the Diet. It has been found that adults can be maintained in satisfactory nitrogen equilibrium on 2/3 to 1 gram of protein per kilogram of body weight. In children, on account of growth requirements, larger quantities of protein are needed, from 1½ to 3 grams of protein per kilogram of body weight. The same results may be arrived at, as suggested by Keeton and Mackenzie (*Ann. Intern. Med.*, December, 1929), by expressing the calories derived from the protein as a percentage of the total calories in the diet, allowing 10 per cent of the total calories in protein for adults and 12½ per cent for children. This would appear to be a convenient and sufficiently accurate method.

3. The Fatty Acid-Glucose Ratio. The total quantity of fatty acids in the diet is represented by 90 per cent of the fat and 46 per cent of the protein. The total glucose in the diet is the equivalent of 100 per cent of the carbohydrate, plus 58 per cent of the protein, plus 10 per cent of the fat. If the available supply of glucose in the diet is inadequate, the fats are incompletely oxidized and ketogenesis results. It is, therefore, necessary to maintain in the diet a proper relationship between the total quantity of fatty acids and the total glucose. This relationship is known as the fatty acid-glucose ratio.

Opinions are divided as to the optimum value of this ratio in the treatment of diabetes. A very low ratio (less than 1) is advocated by the school favoring high carbohydrate, while a very high ratio (from 2 to 4) is recommended by the school favoring a high fat diet. Both extremes are probably best avoided, and in the average case favorable results are to be obtained by a ratio of from 1.2 to 1.5. In special instances there may indeed arise indications for either a higher or a lower ratio. The latter is especially indicated in cases with threatening acidosis, when a liberal supply of carbohydrates with the free use of insulin gives brilliant results. A high FA:G ratio may occasionally prove of value in a well controlled but undernourished diabetic, thus facilitating the administration of a high caloric diet.

When the factors of total calories, protein quantity and fatty acid-glucose ratio have been determined, it becomes relatively easy to construct the necessary equations from which to calculate the proportional values of carbohydrates and fat, thus completing the dietary formula. Keeton and Mackenzie have simplified this calculation by introducing a "constant," which, when divided into the total calories, yields the total glucose of the diet in grams. This constant is 9 R+3.7 for a diet in which the protein calories are 10 per cent of the total, and 8.8 R+3.7 in a diet, in which the protein calories are 12¼ per cent of the total ("R" stands for the FA:G ratio). Thus, if, for example, the total number of calories is 2000, the protein 50, and the FA:G ratio (R) is to be 1.2, then the total glucose in the diet

$$(G) = \frac{2000}{9x1.2+3.7} = \frac{2000}{14.5} = 138 \text{ (approx.)}$$

### INSULIN

A discussion of the employment of insulin in diabetes involves the consideration of (1) the indications for its use, and (2) dosage and frequency of administration.

1. Indications. In general it may be stated that insulin is indicated in any case of diabetes, in which, under proper management, the patient is unable to metabolize completely a maintenance diet. Specifically, the following indications may be named:

a. Acute severe diabetes.
b. Marked undernutrition.
c. Marked acidosis.
d. Complications such as acute infections and surgical operations.

2. Dosage and Frequency of Administration. There appears to be no reliable method whereby the exact dose of insulin can be accurately predetermined. In a given case the initial dose must be roughly estimated and varied from 5 to 40 units, depending on the severity of the symptoms. Special consideration is given to the degree of glycosuria, hyperglycemia and acidosis present. After the initial administration the subsequent doses are determined chiefly by the effect of the previous dose upon the glycosuria. It, therefore, becomes necessary to make frequent urinary examinations (3 or 4 times daily) and occasional blood sugar determinations. The frequency of administration likewise depends upon the severity of the case. The more acute cases may require three or four injections daily (fifteen minutes to one-half hour before meals). In the relatively mild cases one or

two injections may prove sufficient. In short, both the dose and the frequency can properly be determined only by trial and error.

### TREATMENT OF COMA

For a clear understanding of the indications in the treatment of diabetic coma, it is but necessary to bear in mind that in this condition we are dealing primarily with an intense intoxication (ketosis) and secondarily with a state of shock. The latter calls chiefly for warmth to maintain the body temperature, and for the administration of large quantities of fluids, by skin, by vein, by mouth and by rectum. The forcing of fluids also has a salutary effect on the intoxication, as it dilutes the poisonous acid bodies and promotes elimination.

However, the chief remedy for the acidosis is insulin. It is in this condition that the specific action of insulin is most brilliantly demonstrated, and it is here that insulin converts a prognosis of absolute despair into one of cheerful hopefulness. It should be used freely and frequently. An initial dose of from 40 to 60 units should be followed by hourly doses of similar or lesser amounts until the urinary sugar becomes greatly reduced. It is, of course, necessary to examine hourly samples of urine, and completely empty the bladder each time in order to judge rightly the effect of each injection of insulin upon the glycosuria. As the condition improves the insulin dose is gradually diminished and the intervals are lengthened. With the recovery of consciousness, the patient receives liquid foods freely, especially orange juice, milk, oatmeal gruel and ginger ale. As his tolerance is restored, a standard diet is gradually instituted.

### CONCLUSION

In this paper no attempt was made to present an exhaustive treatise on all phases of the treatment of diabetes. It was intended only to indicate in more or less outline form the salient points to facilitate the general understanding of the subject.

617 Medical Arts Building.

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Solitary Cyst of Kidney. Solitary cyst of kidney was found by Herman L. Kretschmer, Chicago (*Journal A.M.A.*, July 19, 1930), in a series of five cases. He says: "This condition is probably not as rare as is generally thought by clinicians, especially urologists. A good roentgenogram ought to show the outline of the cyst in the majority of cases. In cases in which the cyst springs from the lower pole, its recognition from the roentgenogram should be relatively easy. Cysts in the upper pole are not so easily recognized in plain films, and when large they result in changes in the renal outline. The pyelograms may vary, depending on the size of the cyst, its origin and the direction of growth. In this series, one pyelogram was normal and two were definitely abnormal."

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# CEREBROSPINAL MENINGITIS

## TREATMENT BY CISTERNAL PUNCTURE *

Alfred L. Balle, M.D.
SEATTLE, WASH.

During the month of February, 1929, fifteen cases of cerebrospinal meningitis were brought to Seattle City Hospital. These patients were all Filipinos, taken off the American Mail Line's oriental boat. They had been sick for variable lengths of time, ranging according to the history from three to twelve days. In most of the cases the disease had progressed to such a stage that the cerebrospinal fluid had been changed to pure thick pus. They had received no previous treatment.

The difficulties encountered in the treatment of these cases were many, as the patients were all irrational and unable to understand what we were doing for them. The main difficulty was in the administration of the serum by the lumbar method. The marked opisthotonus, the hyperextension of the back and the change of position that the patient had to be subjected to made the lumbar puncture exceedingly difficult to perform. Many times we had to place a strap around the neck and thighs in order to flex the back. This, of course, was an exceedingly painful procedure for the patients, as evidenced by the resistance offered.

It soon became necessary for me to attempt other ways and means for the administration of serum. I then began to use the cisternal puncture and immediately the advantages could be seen. The patient's position in bed could remain practically unchanged as long as he was on his side; there was much less pain; the puncture was easily performed; much time was saved and the patients responded much more rapidly to treatment.

However, I did not use the cisternal puncture routinely but employed it about as often as the lumbar puncture. For one thing I was not sure as to how many times a cisternal puncture could be performed with the large needle that comes with the serum. I consulted several doctors, but was unable to obtain much information on the subject.

When these patients were well on the road to recovery and serum treatment had been stopped, another ship arrived from the Orient with about four hundred Filipinos, among whom were found several cases of cerebrospinal meningitis. These were all taken to Diamond Point Quarantine Station, operated by the government and located on

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* Read before Meeting of King County Medical Society, Seattle, Wash., Oct. 14, 1929.

Puget Sound near Port Townsend. Within a few days there were twenty-two cases in the hospital. The death rate was rather high and I was then asked to go there and take over the treatment of the meningitis cases. It was then I decided to use the cisternal puncture as routine procedure for administration of the serum.

### TECHNIC OF CISTERNAL PUNCTURE

1. Assistant. It is generally advisable to have an assistant who has been instructed in just what you are going to do. In this manner he is able to make it much easier for you. Have him place the patient on the left side and put his right hand on his left cheek to support the head and the left hand over the right cheek. The chin should be pointed to the midline of the chest and the head elevated slightly from the bed.

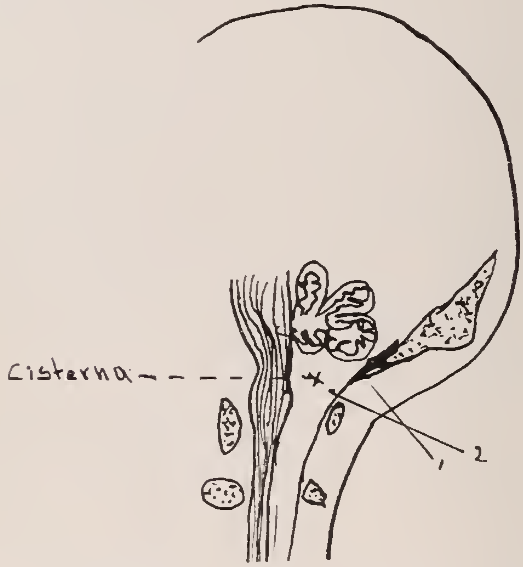

Fig. 1. Drawing of cisterna with first and second positions of needle during puncture.

2. Preparation of skin. The hair of the neck should be shaved and a heavy coating of tincture of iodine applied. This is partly removed with an alcohol sponge. This is to prevent the skin from blistering and also to keep it in good condition for further treatment.

3. The puncture. Anatomically the cisterna magna is the cerebellomedullary cistern, covered by the occipitoatlantoid ligament which stretches between the posterior rim of the foramen magnum and the corresponding position of the first cervical vertebra. The distance for the needle to travel varies from 2.5 to 5.5 cm.

The main point is to find the midline of the neck. This can easily be felt between the two columns of muscles. With slight extension of the head a "dimple" or depression can be felt below the skull. This is the depression between the occipital protuberance and the spine of the axis.

Then force the needle through the skin, line up the needle so that it is straight with the axis of the body. Have the point of the needle follow the skull until it slips under and gently force it through the occiptoatlantoid ligament. There is generally a peculiar "give away" sensation, when the needle slips into the cisterna. However, this is not always felt and a close and careful check is necessary, which is done by pulling out the stylet. If the cisterna is not reached, go a little further in and check again. Be sure the needle is in the midline and that it is straight with the axis of the body. The angle of the needle is about 45° when in the cisterna (fig. 1).

If blood shows up in the needle, it generally occurs just before the latter enters the cisterna, or when it is not in the midline.

4. Amount of fluid removed. This depends upon the amount of serum one wishes to give, the pressure, cloudiness and the stage of the disease. Remember to remove more fluid than you are going to give. Ordinarily 40 to 45 c.c. can be removed, when 30 c.c. of serum is to be given, but if the pressure is great, then remove enough so that it is about normal, up to 75 c.c. Watch the respirations because by too rapid drainage the medulla may be herniated into the foramen magnum by the increased intracranial pressure.

5. Administration of serum. A good routine to follow is during the first sixty hours to perform five cisternal punctures five hours apart and give 30 c.c. of serum at each puncture; then for the next three to four days one puncture every twenty-four hours with the administration of 15 c.c. of serum at each puncture. This usually is sufficient serum treatment. It is probably safer to use the gravitation method in the administration of the serum, because if symptoms of pressure arise the tube can be lowered and the pressure released. Of course, the amount of serum depends upon the condition of the fluid, because if it clears rapidly and the pressure becomes normal, then stop the administration of serum.

When should serum treatment stop? If the fluid clears, the pressure becomes normal and the general symptoms disappear, then stop serum treatment. If the fluid does not clear and the pressure continues increased, stop serum treatment when the above routine has been given. The temperature might be high, the fluid cloudy and under pressure and even the general symptoms present, but even in the face of these symptoms discontinue serum treatment. The temperature generally comes down to normal in a couple of days after serum treatment has been discontinued, but will remain high as long as it is administered.

The cloudiness of the fluid can be due to leucocytes produced by irritation and in response to the administration of serum. This is rather important, because many will continue with serum treatment when the temperature remains high, the fluid is cloudy, the pressure is increased or if the symptoms have not disappeared.

Many have been under the impression that after serum treatment has been discontinued, frequent tappings of the fluid should be performed in order to relieve pressure. This I did not do, because I had found by experience that the more fluid removed the more is produced, probably due to an overstimulation of the choroid plexus in an attempt to keep up the proper amount of fluid within the system. Besides, by removing the fluid we are also removing the antibodies introduced by the serum and the ones produced by the body. If there is increased pressure on the day serum treatment is stopped, leave the patient alone for at least two days and if the symptoms have not subsided then, do a diagnostic puncture. If this puncture shows a clear fluid even with increased pressure, only remove a few c.c. of fluid and give no serum. If the fluid is markedly cloudy, the pressure is increased, and symptoms of meningeal irritation present, then remove 25 c.c. of fluid and give 15 c.c. of serum. Repeat again the following day and leave the patient alone.

Recurrences. There were three cases of recurrences, one of which happened about fourteen days after the first recovery, the others four to five days. The symptoms were headache and stiff neck. They were treated very conservatively, as I only performed two punctures twenty-four hours apart and gave 15 c.c. of serum at each puncture. After this I left them alone and in each case the patient recovered rapidly.

### RESULTS

Forty-eight cases were treated in all at Diamond Point Quarantine Station. Of the first 22 cases who were admitted to the hospital before I took over the treatment 8 died or 37 per cent. Of the 26 remaining cases, admitted after I took charge, one died or 3.8 per cent mortality. These last 26 cases had nothing but cisternal punctures.

### ADVANTAGES OF CISTERNAL PUNCTURE

1. Better distribution of serum at primary site of disease.
2. Easily performed with due care.
3. Less painful to patient.
4. Prevents complications, such as deafness and paralysis.
5. Can be performed in extreme opisthotonus and with delirious patient.
6. Avoids the severe headache which often follows lumbar puncture.
7. Less danger of skin infection.
8. Prevents block.

### DISADVANTAGES

1. Danger of injury to medulla.
2. Danger of hemorrhage over the medulla.
3. Danger of too sudden release of pressure, causing herniation of brain stem into the foramen magnum.

### SUMMARY

Average number of punctures, 8.95.

Average amount of fluid removed, 281 c.c.

Average amount of serum, 160 c.c.

Average fluid clear in 6.5 days.

Average pressure normal in 6.8 days.

Temperature averaged normal in two days after serum stopped.

It seems that with due precautions cisternal punctures are not hazardous to life. I believe it to be just as safe as lumbar puncture. It is generally more painless and has the advantage of avoiding headaches. It can be done in clinic or office and the patient is able to resume his activity soon thereafter. It also appears that cisternal puncture will have an increasingly wider field of usefulness even in routine diagnosis. The only point is to be careful and, if the opportunity present itself, perform one on a cadaver or at the postmortem table.

Accounts of use of the cisternal puncture in the treatment of cerebrospinal meningitis and for clinical diagnosis of spinal fluid are beginning to appear quite frequently in the literature. Recently two doctors gave an account of having performed 2019 cisternal punctures routinely in clinical diagnosis[1] and a report appeared in the last A. M. A. journal, where cisternal puncture had been used in conjunction with lumbar puncture in the treatment of ten cases of meningitis.[2]

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Virginia Mason Hospital.

# POLIOMYELITIS

## IS 1930 BRINGING IT TO THE PACIFIC NORTHWEST?*

S. M. Creswell, M.D.
T. J. Porro, PH.C.
Carl E. Wallace, B.Sc.
TACOMA, WASH.

A study of the incidence of poliomyelitis on the Pacific Coast during the last decade offers a warning of immediate interest to the medical profession of the Pacific Northwest. Since early diagnosis is essential to the successful treatment of this disease, every physician is eager to anticipate an epidemic in his community. Surely, preparation for an impending outbreak is of first concern. Available statistics indicate that the incidence of poliomyelitis on the Pacific Coast has not decreased during the past ten years. The outbreaks have not been so severe as some of the Eastern epidemics, but the consistency and regularity of occurrence compel attention.

It will be noticed from figure 1 that the entire Pacific Coast was relatively free from infantile paralysis during 1920, 1922, 1926 and 1929. In 1921, 1924, 1925, 1927 and 1928 there were decided elevations along the coast, although the prevalence in the different states varied. It is worthy of note that only one year, namely 1923, brought an elevation to California without also producing a rise in one or both of the two northern states.

It would not be characteristic of poliomyelitis, if the figures from these different states had been found to correlate more perfectly. Yet, despite the obvious sporadic occurrence of this disease, there seems to be a certain rhythm in the larger outbreaks. Dickey, of the California State Health Department, reports that every year during the past ten years the greatest increase in number of cases in California has occurred during the months of July, August and September. Stricker and Simpson, for Oregon and Washington respectively, report their maximum high points in September and October.

California reports for 1930, up to August 1, 730 cases or 12.8 per 100,000 population. It is obvious that this situation justifies concern, since 1927, California's largest epidemic year during the last decade, showed only a total of 1298 cases or 28.4 per 100,000 population.

A comparative analysis of the mortality rates for the three states during the ten years reveals a relatively high average: California, 19.3 per cent; Oregon, 25.2 per cent; Washington 28.1 per cent.

If every physician is aroused to the necessity of watching for the earliest signs of poliomyelitis in this territory, we may be able to avoid the error common to such epidemics, that is, incorrect diagnosis in the preparalytic stage. The "abortive" type of poliomyelitis will not be considered in this paper. The symptoms of the preparalytic type or stage with its central nervous system involvement by way of the meninges are more or less constant. Some cases never develop paralysis, it is true, but all patients must be considered potential paralytics.

The systemic symptoms of fever, gastrointestinal upset, drowsiness, irritability, headache, rapid pulse and respiration and flushed and anxious face rarely give sufficient evidence for diagnosis. However, in the nervous system we see symptoms more characteristic of infantile paralysis: increased deep tendon reflexes, moderate rigidity of the neck with pain upon flexion, stiffness of the spine with pain in the lumbar region upon anteflexion, hyperesthesia and pain in the popliteal regions. Less often do we find MacEwen's and Brudjinski's signs positive, and still more infrequently positive Kernig's and Babinski's signs. Aycock[1] has found a cerebral tache almost always present, often becoming a purplish line sometimes more than half an inch in width.

A tentative diagnosis of poliomyelitis may be confirmed by spinal puncture. In our experience the spinal fluid in the presence of meningeal irritation always shows an early increase in cell count, mostly lymphocytes, and a slight increase in globulin content. The cell count may range from 10 to 500 or even higher. The spinal fluid pressure is only moderately elevated. Leake[2] emphasizes the necessity of utmost care in making the puncture, as even the slightest hemorrhage into the subarachnoid space may result in more harm than good.

Flexner,[3] Amoss,[4] Aycock and others agree that the most effective means of preventing paralysis or at least diminishing its severity is the use of recent convalescent serum during the early stages of the disease. In order that sufficient serum be available at the moment of need, foresight must be exercised. The United States Public Health Service advises that the organization for treatment be handled by medical societies, medical schools or local health departments. Before the approach of an epidemic blood must be procured from convalescents and serum prepared.

In view of the above facts, the health department of Pierce County, Washington, has collected

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* From the Porro Biological Laboratories.

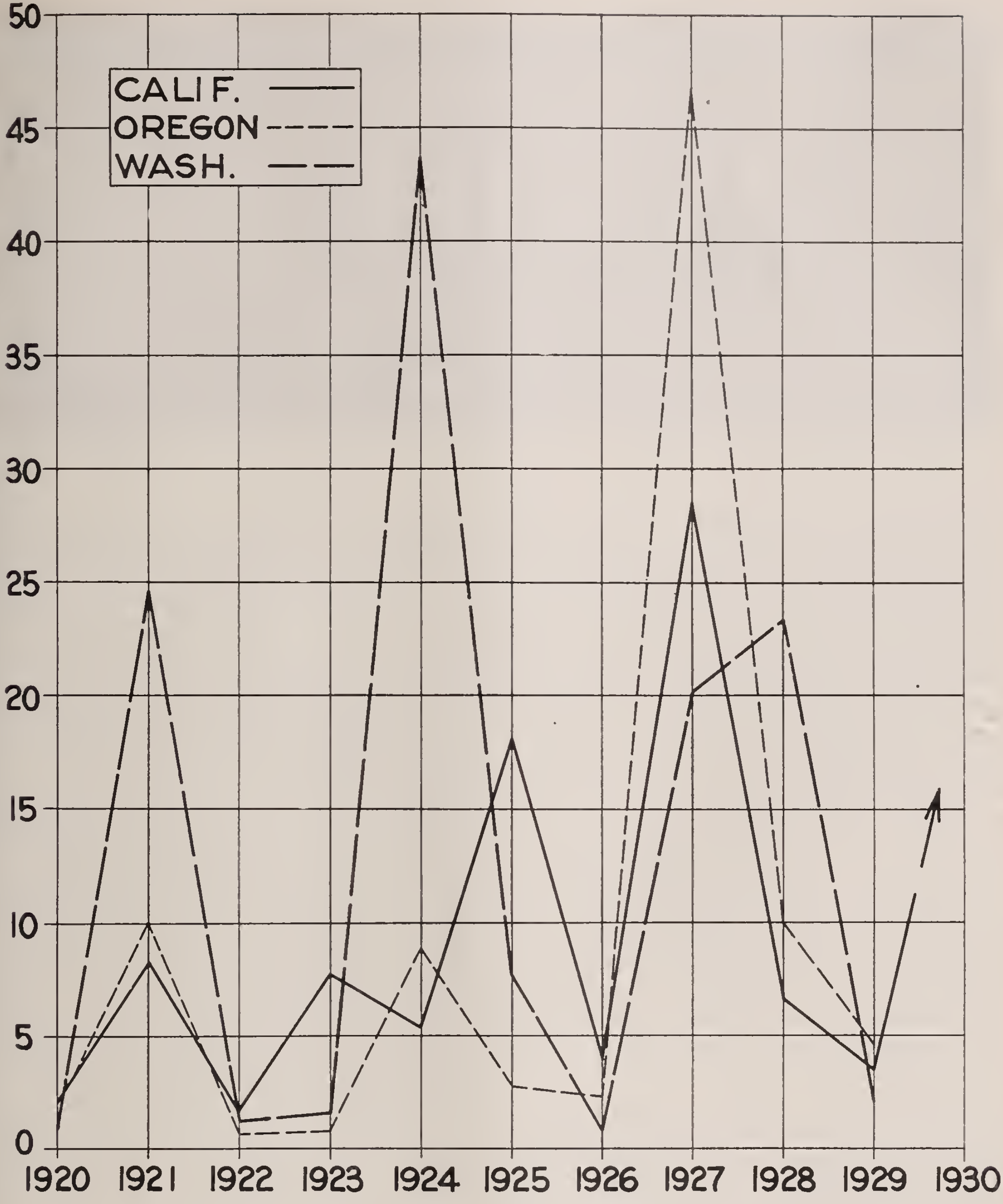

Fig. 1. Incidence of poliomyelitis per 100,000 population in California, Oregon and Washington.

quantities of blood and is preparing serum for local use. Only blood from persons who have had poliomyelitis within the last six years has been utilized for the preparation of convalescent serum. Three types of donors have been used: those exhibiting permanent paralysis, those giving history of paralysis with recovery and those having available a reliable record of an increased spinal fluid count during an epidemic of this disease. The amount of blood withdrawn from each donor has varied from 100 to 500 c.c., depending entirely on weight and physical condition of the subject. Due to the fact that a number of patients have been left in relatively poor health, the usual amount of blood taken has been 100 c.c. The donors have given their blood willingly and have received the standard price for blood for transfusions.

Authorities differ as to dosage of serum and route

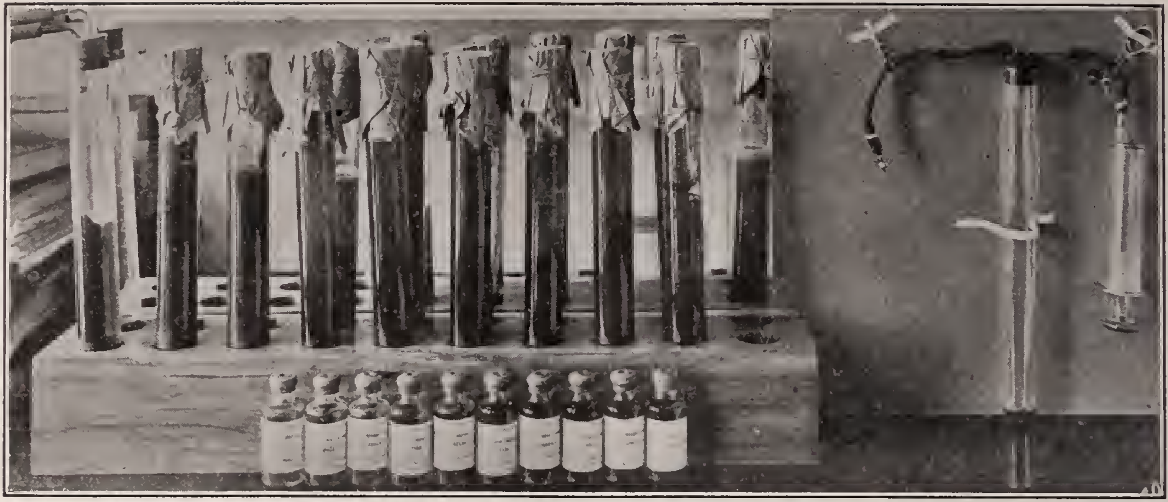

Fig. 2. Apparatus used in securing blood for convalescent serum; also blood and serum ready for use.

of administration. Aycock gives 20 c.c. of warm serum intrathecally, providing as much or more spinal fluid has been withdrawn. This is followed by an injection of 60 c.c. of serum into the vein. The injection into the spinal canal is repeated the following day and also intravenously, if the patient still runs a fever. Amoss has used similar routes and calls attention to the fact that the amount of serum to be given intrathecally is limited. Draper[5] warns against serum reactions caused by large injections into the spinal canal.

Convalescent serum administered only intramuscularly is of distinct value according to the experience of Shaw and Thelander.[6] The advantage, they feel, is that it can be used in the very early stages before conclusive diagnosis is possible, without jeopardizing the patient. By the intramuscular route Shaw gives from 20 to 30 c.c. at varying intervals until improvement is assured. In both of these methods spinal drainage is used as spinal pressure demands.

The apparatus used to obtain the blood is shown in figure 2. The test tube, 32 by 300 mm. in length, is made of heavy wall pyrex glass, having a capacity of about 150 c.c. Experience has shown the advantage of a tube of this size and shape over a larger one or flask, in that there is a better retraction of the clot with a resulting larger yield of serum. The most suitable needle for this work is an 18 or 20 gauge. A 50 c.c. syringe is found to be quite satisfactory for regulating the vacuum in the test tube.

The donor is placed on the table and the area over the median basilic vein sterilized in the usual manner. The clamp on the syringe side of the apparatus is now released and the air in the tube exhausted by the syringe. (It may be necessary to repeat this process several times during the operation). The clamp is again tightened, a tourniquet applied to the arm of the subject, the needle inserted into the vein and the clamp on the needle side released, permitting the blood to flow into the tube. The tourniquet should now be loosened. If a larger quantity of blood is desired, the tube in use may be replaced by a second.

The blood is allowed to remain at room temperature for about two hours and is then placed in the ice box for at least twenty-four hours to facilitate clot formation. During this time Wassermann and Kahn tests are made on each blood and cultures are taken for bacterial contamination. The individual serums are separated from their clots and pooled in a large flask. This mixture is then transferred to large centrifuge tubes and centrifuged until clear, after which it is again tested for bacterial contamination and placed in 30 c.c. bottles for final use. Greater therapeutic value is assured by the pooling of blood from at least five donors.

## CONCLUSION

1. A study of the presence and incidence of poliomyelitis on the Pacific Coast during the past ten years suggests that the disease, now present in California, will probably appear in Oregon and Washington this fall.

2. The necessity for early diagnosis and prompt treatment of poliomyelitis makes it essential that physicians, health departments, medical schools and medical societies be alert to the approach of

an epidemic, watch for the symptoms in the earliest cases and be ready with sufficient quantities of potent serum before the outbreak actually occurs.

3. Whether or not 1930 brings poliomyelitis to the Pacific Northwest, the medical profession of this territory should be preparing now without delay for that possibility.

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1023 Pacific Avenue.

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Patient with Heart Disease as Surgical Risk. Four hundred and fourteen patients suffering from heart disease, who underwent 494 operations, were studied by Stuyvesant Butler, Chicago; Neil Feeney, Montreal, and Samuel A. Levine, Boston (*Journal A. M. A.*, July 12, 1930), in order to determine the risk of operation and the role played by the heart on the outcome. Deaths were divided into two types, "unexpected" and "inevitable." There were 28 unexpected deaths; i. e., a mortality of 6.3 per cent. One hundred and forty-seven operations were performed on 120 patients with valvular heart disease, with 3 unexpected deaths; i. e., a mortality of 2.1 per cent. One hundred and sixty-seven operations were performed on 138 patients having chronic myocarditis, with eight unexpected deaths; i. e.„ a mortality of 4.9 per cent. These patients were mostly older persons and tolerated operation well. There were 108 operations performed on 87 patients with auricuiar fibrillation, with 3 unexpected deaths; i. e., a mortality of 3 per cent. Contrary to the general opinion, the risk of operating on such patients is not great. Forty-one operations were performed on 35 patients having angina pectoris, with 3 unexpected deaths; i. e., a mortality of 7.7 per cent. There seems to be a slight risk of coronary thrombosis following in the wake of surgical intervention in patients with angina pectoris. There were 20 operations performed on as many patients with coronary thrombosis. There were 8 unexpected deaths; i. e., a mortality of 44.5 per cent. Various measures discussed here should materially diminish this high death rate. Thirteen operations were performed on 11 patients with syphilitic aortitis. There was one unexpected death. There were 6 patients with paroxysmal tachycardia, 3 of whom had attacks during operation and 3 after operation. All recovered. There were 50 operations performed on as many patients with congestive heart failure. There were 7 unexpected deaths; i. e., a mortality of 17.1 per cent. There were 433 operations performed on 359 patients having heart disease without nephritis. Twenty unexpected deaths occurred; i. e., a mortality of 4.9 per cent. There were 61 operations performed on 55 patients having heart disease with nephritis, with 8 unexpected deaths; i. e., a mortality of 14.8 per cent.

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# J. A. W. HEDENUS OF DRESDEN

Wayne J. Stater, M.D., F.A.C.S.
PORTLAND, ORE.

We are interested today in the recognition of one in the medical profession who has achieved outstanding services for it and thus for the people. We are interested in those members of the profession, whose achievements have not escaped recognition but particularly in one whose praiseworthy exertions have not received the esteem which they so earnestly merit.

The one about whom we wish to speak, we believe, has not been accorded a proper place in medical history for his heroic deeds in connection with the development of the surgery of the thyroid gland. All are familiar with the magnificent contributions of Kocher and Billroth and their pupils to this problem, but who is closely acquainted with the contributions to the surgery of the thyroid gland which was furnished to the medical profession by the redoubtable August Hedenus of Dresden.

Before the contributions of Pasteur and Koch to the science of surgery, before the discovery of anesthesia by Long and Morton in America, before the introduction of antisepsis by Lord Lister of England, J. A. W. Hedenus performed six successful operations for extensive thyroid lesions, than which the chronicles of surgical prowess record no greater achievement.

These operations were performed with only crude instruments for the control of hemorrhage and without anesthesia or an aseptic technic. It is difficult to understand how such brilliant results were achieved so many years ago under such formidable handicaps, when the modern art of surgery depends upon hemostasis and those outstanding contributions of the science, anesthesia and asepsis.

The art of surgery preceded the science so illustriously in Hedenus' heroic and brilliant performances that it seems apropos to note this incident, where the craftsmanship of surgery preceded the science, but not because this relationship is unusual. The skillful feats of present-day surgery do not smack of the same quality as his accomplishments in the art more than one hundred and twenty-five years ago, when we consider his handicaps, the lack of our modern handmaids of surgery.

His personal characteristics and his remarkable training in anatomy, as well as his excellently conducted general training, made him well adapted to his subsequent career. He was endowed with a blissful equanimity, courage, determination and perseverance, more native than acquired endowments, and with ample will to employ them in his courageous but well planned actions.

It may truly be stated that the art of thyroid surgery began with the works of Hedenus in the year 1800, at the time the Royal College of Surgeons of England was incorporated by a charter of George III, the surgeons having separated from the barbers in 1745. Hedenus' triumphs were achieved at the time when the capital of the young United States was moved from gay Philadelphia to rustic Washington.

It is true that attempts had been made for many centuries to successfully treat this conspicuous malady. Abul Casem Khalaf Ebn Abbas, usually known as Albucasis, a bold operator of the tenth century, is said to have attempted surgical removal of a goiter in the year 939 A.D., but the extent and character of this procedure is not entirely authentic. By 1864 Gunther had attempted a review of this literature and had collected forty-one authentic operations, but Halsted, who has beautifully and carefully delineated the operative story of goiter from the beginning to the early years of the twentieth century, on more careful perusal of the literature added sixty-five more, covering the period from Celsus to 1861. The majority of these procedures, by and large, were only ligations, enucleations of an adenoma or partial resections usually of one side.

In discussing his six successful operations for goiter Hedenus states that they are the most difficult surgical feats to be dealt with on account of the arteries, veins and nerves. The leading authorities of the time advised against the operation and Wichman, condemning any who might attempt it, stated that to do so was equivalent to cutting off one's neck. Professor Richter, who was held in the highest esteem by the profession of his time, did not believe the operation justifiable under any circumstances on account of its dangers. Not only did Hedenus' contemporaries censure the operation but many of the leading surgeons for many years afterward believed it unachievable.

Notwithstanding these hazards he successfully performed the operations, realizing that if he did not interfere the patients would ultimately take their exitus from suffocation. Moreover, he wished to demonstrate to his students what a calm and determined surgeon properly equipped with anatomic and surgical knowledge could accomplish for the good of mankind and for the relief of suffering.

Our chief interest in Hedenus' operative procedures lies in his operative method for goiter, yet his original technic for tumors of the antrum of Highmore, that in dislocations and fractures, and his many dissertations on a wide range of subjects are likewise of considerable interest and importance. A vertical midline incision was used for his goiter operations. The tumor was early liberated in the operation in order that the superior and inferior thyroid arteries might be ligated as early as possible. Before this could be accomplished, Hedenus states, it was often necessary to ligate a number of arteries, often fifty or sixty. The pedicle of the tumor (the isthmus) was transfixed with double ligature and tied off, a procedure that was followed universally with few exceptions for three-quarters of a century. While the convalescence was usually stormy, all of the patients recovered.

Little was being done in the line of operations at the time of Hedenus but, following his performances, there slowly developed a new interest in surgical therapy and this was greatly stimulated upon the presentation of anesthetics, since the control of pain is one of the fundamental principles of surgical handicraft. But sepsis lay in the wake of the early ripple of operative therapy that was ushered in by anesthesia, and supervened upon nearly every wound in the form of hospital gangrene, septicemia or pyemia, and more frequently in the hospital than on the outside.

With the advent of Listerism confidence was slowly restored and the banner of operative endeavor was carried forward in this field chiefly by the Swiss, Austrian and German surgeons, the other nations contributing little to the art in the early period. The importance of the contribution of von Mikulicz, the operation of resection, cannot be overestimated. The recurrence of exophthalmic goiter cannot be shown to be the result of incompleteness of the operation of conservative subtotal thyroidectomy. Indeed, sufficient thyroid tissue must be removed but contiguous structures must be left unharmed. Any operation that leaves in its wake nerve injuries, tetany or other serious complications cannot be termed successful. And we hope that the school which practices the complete removal of thyroid tissue for this disease will observe the clinical course of complete recovery, following the conservative operation in most cases.

The development of the operation for goiter which received its early stimulus from Hedenus, an innings for the art, baffled solution for many hundreds of years but may today be successfully performed by any competent surgeon. Indeed, we may say that the perfection of operative technic in dealing with lesions of the thyroid gland has long since been attained and progressive surgeons are striving for the solution of more fundamental problems in this connection. Of special interest is the study of the etiology of goiter, to elucidate a method of prevention is the goal, and with these measures in our hands fewer cases with this malady will come under the knife.

This remarkable character, Johann August Wilhelm Hedenus, was the son of an apothecary. He was born on August 11, 1760, at Langensalza in Thuringen. His early education was obtained at the local Latin High School but at the same time he was tutored by his father in the subjects of his own profession, pharmacy and chemistry. At the same time he was instructed by the Regimental Surgeon Wendt and by the great philologist, Rector Meiner.

He pursued his medical studies in Dresden at the medicochirurgical college. In 1783 he was appointed company surgeon to the infantry regiment, "Prince Clemens," and retained this position for nine years but attended lectures in Dresden for two years during this time, paying particular attention to surgery and obstetrics, in which he was especially interested.

In 1791 he was appointed pension surgeon and amaneunsis to the prosector, and two years later he was promoted to prosector at the medical college in Dresden. At this time he received permission to practice medicine. In 1798 he was promoted to general staff surgeon and professor of surgery at this institution.

In 1808 he was appointed personal surgeon to the king of Saxony, Frederick August the Just, when it became his duty to accompany the king on his journeys into foreign countries, and by this means he made connections which led to his illustrious practice in foreign countries.

In 1812 he became senior personal surgeon which automatically made him a member of the sanitary faculty. At the same time he was appointed Court Councillor. Three years later he was knighted in appreciation of his great services to the state.

In 1824, after the disbandment of the sanitary faculty, he was appointed Medical Councillor. The medical faculty of Leipzig shortly afterwards, in special recognition of his services to the medical profession and the state, conferred the degree of Doctor upon him.

In 1833 he was retired from active duty as Medical Councillor with retention of title and pay. During the same year he celebrated his fiftieth year jubilee in the service of the state. The Society of Naturalists and Physicians of Dresden had a special medical coined in commemoration of the occasion.

With advancing age he became susceptible to pneumonia nearly every winter but a summer's stay at the bathing resort at Schandau usually helped him to regain his strength, but the relapses became more and more protracted and he died December 28, 1836, in Dresden.

> "Hector is gone.
> Who shall tell Priam so or Hecuba?
> Let him that will a screech-owl, aye be call'd
> Go into Troy, and say there Hector's dead.
> There is a word will Priam turn to stone,
> Make wells and Niobes of the maids and wives,
> Cold statues of the youth; and, in a word,
> Scare Troy out of itself. But march away:
> Hector is dead; there is no more to say."

Journal Building.

FETAL CEPHALOMETRY IN UTERO. The average figures of the usual cephalic measurements of unmolded new-born infant heads show a departure from the measurements of molded heads. A comparison of the average figures for the various head diameters and circumferences shows a distinct ratio between the occipitofrontal diameter and the other diameters and circumferences. A knowledge of the occipitofrontal diameter in utero enables one to compute the biparietal diameter and the occipitofrontal circumference with sufficient accuracy for obstetric purposes. A knowledge of the occipitofrontal diameter in utero is of value in establishing the age of the fetus in utero. Herbert Thoms, New Haven, Conn. (*Journal A. M. A.*, July 5, 1930), presents his procedure for estimating the occipitofrontal diameter in utero. The plane to be measured must be identified and the distance above the sensitive plate measured. This is performed by means of abdominal palpation and a pair of dividers. After the plane through which the occipitofrontal diameter passes has been established and the number of centimeters above the sensitive plate measured with the patienc in the horizontal position, the exposure is made with the tube at a distance of 36 inches, centering directly over the midpoint of the diameter. With the tube and exposed plate still in position, the patient is removed from the table and the perforated lead plate is introduced in the same plane as that occupied by the occipitofrontal diameter. This plate is a 17 by 20 inch sheet of lead, 1 mm. in thickness, mounted on a board and perforated with tiny holes just 1 cm. apart. A flash exposure is made on the previously exposed plate, and on development will be seen the image of the fetal head shadow and a series of black dots, farther apart than 1 cm., but representing the centimeter scale in the plane of the occipitofrontal diameter. This corrects for at least a working basis the divergence of the rays in their passage from the target to the plate. In viewing the developed plate, it is obvious that not only may the occipitofrontal diameter be readily measured but an outline of the cranium may be easily drawn to scale. This should be of importance in studying the effect of labor on the molding process of the infant head. Such studies are now being made in the author's clinic.

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of the Pacific Northwest

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# EDITORIAL

## THE DRUG RACKET

At the recent Pacific Northwest Medical Association meeting at Butte, Dr. C. D. Leake, professor of pharmacology at the University of California Medical School, applied the term "drug racket" to the multiplicity of preparations of well known and accepted pharmacopeial drugs which are zealously offered to practicing physicians. He stated that they possess no therapeutic effects superior to the drugs with established reputation, but they sell at exorbitant prices which is an imposition on the unsuspecting patient. An example is the recognized hypnotic barbital, whose effects are well known to all physicians. He enumerated a half dozen or more preparations with fancy names prepared by various drug manufacturers, each of which is recommended as superior to barbital and which costs the patient from two to six times the price of this drug. He stated that no evidence has been confirmed that any of these are in any respect superior to the drug which they aim to supersede. Other drugs were cited with established therapeutic effects which are duplicated by various preparations under numerous drug names, all of which cost the patient increased expenditure of money with no corresponding increased therapeutic results. An earnest appeal was made that physicians should confine prescriptions to drugs recommended by the Pharmacopeia and indorsed by New and Nonofficial Remedies.

The speaker dated the flood of proprietary remedies which have in recent years captured the patronage of the medical profession to a striking extent, to the era of therapeutic nihilism, instituted by beloved and authoritative Osler. He advocated the return to the Hippocratic doctrine of depending upon nature in the healing of disease. As a result of this influence there followed a lapse in prescription writing so that many physicians graduated with little knowledge of this art. This left an open field for the seductive approach of the skillful detail man from a drug house, who persuaded the pliant practitioner to administer the palatable, attractive preparation designated by a fanciful name which often conveyed no idea of the drug which constituted its basic principle. The present urge is that medical practitioners return to prescribing individual drugs to obtain expected results, both in the interest of the patient for recovery from disease and the conservation of his financial situation. The plea, presented with attractive zeal, is one which should demand the thoughtful attention of all earnest and conscientious practitioners.

## IMPRESSIONS OF THE AMERICAN MEDICAL ASSOCIATION AT DETROIT

Much of life is a question of clear vision and one's point of view. So the annual gathering of the members of the American Medical Association means many things to many people, as scientific papers, lectures on subjects they are interested in, scientific exhibitions, meeting men personally one has known by reputation, reunions, seeing old friends, little social gatherings in various rooms, medical politics and electioneering, the great mass of work in the house of delegates and its many committees, shopping, sight seeing, side trips and tours. In reporting one of these meetings it is difficult in a short column to pick out the things, in which most men who did not attend are interested. After all is over, the impressions which best stand out as the really big things are those of the House of Delegates.

The A. M. A. has many to criticize it, but we wonder if the average member knows what this organization is doing for him. Sitting through the meetings of the House of Delegates would be most illuminating. Here health problems are debated and the solution of our difficulties discussed. Our organization has no police power, so it must depend upon national publicity and the legislative friends of the officers and delegates.

Among the subjects thrashed out at this session was the work of the U. S. Veterans' Bureau, 85 per cent of which was incident to civilian life and 15 per cent service connected, with $800,000,000 for this year's veterans' budget. There was discussion of the working of state medicine in England; the interference of the U. S. Federal Government in narcotic and alcohol prescriptions, demanding a written diagnosis and thus violating the confidences of patients; the creation of medical centers by county medical societies to take care of part pay patients, the division of patients into three classes, pay, part pay and pauper.

A new council was created on Economics and Public Relations, to study the physician's side of medical and industrial contracts. The Committee on Education and Hospitals is working to still further standardize hospitals, medical schools and so-called advertising of hospitals. The saving of tax on earned income, where groups, clinics and assistants are concerned, will result in saving thousands of dollars of income tax to doctors. The Sheppard Towner Maternity and Infancy Act was voted down and resolutions sent to Congress. Cooperative diagnostic laboratories controlled by laymen were condemned. A measure was passed to check clinical thermometers, making academic green the official color of the A. M. A. ribbons. Psychiatric service to assist the courts in disposition of offenders, a thorough investigation of all hospitals caring for mental patients, and teaching the public through the bankers to save for sickness were advocated. On top of this we have that great service of medical information, the labors of the Council on Pharmacy and Chemistry, the A. M. A. Directory and the Quarterly Index Medicus, labors of love for our profession. These are just a few of the things our Association is doing. We should be better organized locally to properly support the American Medical Association.

## THE IDAHO ANNUAL

The meeting of Idaho State Medical Association at Coeur d'Alene will be an abiding delightful memory for all who had the pleasure of being present. The visitor to this city, resting on the shore of Lake Coeur d'Alene, has an entrancing vision of a beautiful body of water, nestling among the mountains, with many attractive bays which afford choice sites for residents of this city and Spokane. One feature of the entertainment was an excursion on this charming body of water, which is thoroughly utilized by those familiar with it. A short distance in the opposite direction is Hayden Lake with its attractive Bozanta Tavern which is extensively patronized by physicians and families from Spokane and other cities outside of Idaho. The attention of doctors and wives of Coeur d' Alene to visiting physicians was highly appreciated, serving to make the meeting one of outstanding delight.

The topography of Idaho is such that a medical meeting in the northern part of the state attracts in larger numbers the physicians north of the mountains. This accounts for the preponderance of registration from that region. The proximity to Spokane always makes it convenient for visitors from that section of Washington. It was a delight to note the cordial relations between the physicians of these adjacent states. In addition to papers from Idaho and Washington representatives, the program was made especially attractive by those from Dr. Kerr of University of California, Dr. Dillehunt from University of Oregon, Dr. Stalling of the Veterans' Hospital, Boise, and Dr. Heusinkveld of University of Colorado. Each brought a message of value which benefited all those in attendance. These annual meetings serve to emphasize the qualifications of practitioners in our northwestern states, which is second to none in other parts of the country. In spite of the attractions and profit of meetings of regional and national character, the sessions of state associations retain their importance and vital interest.

## THE AMERICAN UROLOGICAL ASSOCIATION

The American Urological Association held its seventy-seventh annual meeting in New York City on June 10-12. It was a record meeting in attendance, in enthusiasm, in operative clinics, in its scientific program and extraordinary hospitality.

It was memorable for the introduction of intravenous urography. Professor Alexander Von Lichtenberg stimulated the interest in this study and gave it a clinical trial. He read the first paper, and was followed by Professor Arthur Binz, also of Berlin, who perfected the chemical, named uroselectan. Early this year some of this was sent to America for trial, so the paper was well discussed. It places in the hands of the urologists and diagnosticians a valuable aid in urologic diagnosis. The drug outlines the kidneys, ureters and bladder. It is a question of renal elimination and catching the roentgen-ray exposure at the maximum concentration in the patient. It was also Von Lichtenberg who gave the art of pylography to the medical world.

Professor E. Papin of Paris gave a notable paper on "Conservative Renal Surgery," which he demonstrated in his operative clinics in and around New York. These wet clinics were most enjoyable, held by Papin, Von Lichtenberg and a number of the well known New York urologists. The number of medical and surgical patients in New York corresponds to its immense population; it seems unlimited. New York may well feel proud of this meeting.

## OBSERVATIONS ON THE BUTTE MEETING

It was the consensus of opinion on the part of all who attended the Pacific Northwest Medical Association meeting at Butte that one of the best programs in the history of the organization was presented on this occasion. Although the registration of about two hundred would not compare with that of meetings on the Coast, yet this number was conducive to intimacies that would not pertain to larger numbers. At the same time there was an opportunity for personal contact with the lecturers from various parts of the country which enabled one to appreciate more thoroughly the message presented by each one. Some of the speakers have functioned on previous programs. Their papers as well as those offered by men who have not hitherto appeared were of an exceptionally high standard, dealing with modern problems, showing the results of personal research and combining the latest information on the topics considered.

While an extensive discussion of individual papers is not in place at this time, there were some outstanding characteristics of each of the lecturers which served to emphasize their individualities. Dr. A. J. Carlson of University of Chicago Medical School is a delightfully genial character, familiar to the profession of the Northwest, whose presence is always welcome. His addresses on the involuntary nervous system and its association with different bodily functions were most enlightening. The importance of the role in the bodily economy of this obscure and little known system was clarified to a large extent by the description of the various experiments and studies. This speaker is always a welcome feature of any program of this organization.

Dr. C. B. Leake of University of California Medical School is one of the most dynamic speakers who has appeared on these programs. While one might consider pharmacology and the description of drugs dull subjects before the ordinary audience, this speaker put life and energy into everything which he discussed. His forceful attacks on deceptive drugs and preparations was presented in a fascinating manner. One realizes the care and discrimination needed for successful drug therapy, when it is presented by such a thorough student and careful therapist.

Dr. Rivers of the Rockefeller Institute for Medical Research is a polished student and speaker who has devoted his energies to many obscure problems in the realm of bacteriology. Filterable viruses received especial attention. His arguments in favor of their etiologic role in the production of certain diseases, whose bacteriologic causes have not been ascertained, was most convincing. One lecture was devoted to the subject of psittacosis. While one who has had no connection with parrots may think he has no interest in this disease, the speaker presented evidence that this disease may already be endemic in this country. The fact that it may be conveyed to other animals who may play a role in human infection was also suggested. He presented a vivid description of symptoms and course of the disease in one of the doctors who contracted it in the laboratory.

Dr. A. K. Krause of Desert Sanatorium and Institute of Research is one of the outstanding students of tuberculosis in this country. His three addresses were on some phases of this disease. He is an optimist on the subject of controlling and arresting this widespread affliction. He believes that most cases of surgical tuberculosis can be cured without operation, if subjected to the routine applied to pulmonary tuberculosis with the exercise of sufficient patience to cover a long period of application. He discussed many interesting phases of the tuberculosis problem and methods of treatment.

Dr. Hilding Berglund of University of Minnesota Medical School dealt with the anemias, gastric ulcers and Bright's disease, emphasizing important modern methods of treatment and applications to these conditions. He is an attractive speaker, with a convincing message for his hearers. Dr. G. B. Eusterman of the Mayo Clinic devoted his three addresses to gastric and duodenal lesions which occupy so large a role in medical practice of today. With a wealth of material at his command which is obtainable in Rochester, he spoke with authority and conviction on all phases which he considered. It was a pleasure and satisfaction to hear such addresses.

Dr. E. I. Bartlett of University of California Medical School presented details of surgical pathology and technic valuable to all in attendance. It is delightful to listen to the personal experiences of a surgeon who has for many years dealt with problems which he can offer with clarity and conviction. His presence was a source of gratification to his interested audience. Dr. Harold Brunn of University of California Medical School delivered two addresses on atelectasis of the lungs with illustrative roentgenograms which demonstrated the importance of this condition in pulmonary consolidation. It has often been confused with pneumonia, although the differentiation can usually be clarified by roentgenography. He described certain spectacular resolutions of this condition which indicated the astonishing recovery following suitable treatment. His consideration of cancer of the lung was likewise a most interesting and instructive discussion.

Dr. Emile Holman of Stanford University Medical School is well known to audiences in the Northwest. His writings on pulmonary surgery for the relief of abscesses, tuberculosis and other conditions have been among the most enlightening on these topics. These subjects were further developed at this meeting, adding much to the knowledge of his auditors concerning them. He is a delightful personality, who will always be welcome among the profession of this section. Dr. A. S. Lobingier is a distinguished surgeon of Los Angeles who presented interesting papers on gallbladder and pancreatic disease which displayed his complete familiarity with these conditions. Dr. Meyer Wiener of Washington University Medical School had a section of his own on ophthalmology. His addresses covered various phases of treatment and operation for diseases and injuries of the eye. The ophthalmologists present obtained satisfaction and profit from the discussions by this distinguished member of the profession.

The city of Butte is unique in its situation and environment. Being a magnified outgrowth from a mining camp, it possesses some of the latter's features, to gether with the attributes of a modern city. Inspection of a mine and its underground life offers a fascination to the uninitiated. Many visitors took advantage of this opportunity and observed the process of ore extraction. Much amusement accompanied attendance on the dog races with rising and ebbing fortunes of many observers. The hospitality of the Butte physicians and their wives added greatly to the delights of the meeting.

It is a task of some magnitude to prepare the annual programs of this organization and to assemble speakers from various parts of the country. The success in accomplishing this work is evidenced by the satisfactory and pleasing programs which have characterized its history during the past eight years. The credit for carrying on the work of this association is primarily due to the secretary, Dr. Frederick Epplen of Seattle. Papers and discussions presented at this meeting will be published in future issues of this journal, depending upon the number which may be secured for this purpose.

## THE WASHINGTON MEETING AT BELLINGHAM

The annual meeting of Washington State Medical Association will be held at Bellingham September 1-3. The first day, Monday, will be devoted to a golf tournament which will be held in the city. The program Tuesday and Wednesday is scheduled to be held at Mount Baker Lodge, situated on famous Mount Baker, one of the noted peaks of Western Washington. The hotel and cabins will afford ample accommodations for all who will attend the meeting. The hotel and grounds will be devoted exclusively to this association meeting. Thus two enjoyable days are in prospect with opportunities for mountain climbing and scenic snow views which are unrivaled in their beauty and majesty.

There are two routes to Mount Baker. Driving from the south one can leave the highway at Burlington, passing through Sedro Woolley and Wickersham, following through the valley. This is twenty miles shorter than by Bellingham. The other route passes through Bellingham by way of Chuckanut Drive, one of the most picturesque and noted highways on the Sound. Both routes are over paved highways and either will provide a very attractive journey.

Immediately following this meeting will occur the annual meeting of Pacific Coast Oto-Ophthalmological Society at Victoria. Dr. C. M. Erb, of Bellingham, will take a group of twenty-five or thirty guests on his launch for a trip among the Islands and subsequent attendence at this meeting.

Under the auspices of the State Board of Health the annual meeting of county and city health officers of Washington will be held at Bellingham, September 4-5, immediately following the state association meeting. It will be supervised by Dr. A. E. Stuht, Seattle State Director of Health. An interesting and profitable program has been prepared.

### PROGRAM

Monday, Sept. 1
Golf Tournament at Bellingham

Tuesday, Sept. 2

9:00 a.m. Meeting of Board of Trustees; House of Delegates.

10:00 a.m. "The Treatment of Acute Diffuse Septic Meningitis by the Intramuscular Injection of Auto-Cerebrospinal Fluid." Preliminary Report. Dr. J. T. Rooks, Walla Walla. Discussion by Dr. E. S. Lauzer, Rock Springs, Wyo.

"Surgical Diseases of the Spleen." Dr. Dean Lewis, Johns Hopkins University, Baltimore.

12:00 a.m. Public Health League Luncheon.

1:30 p.m. "Vomiting in Infancy." Dr. E. J. Barnett, Spokane.

"Separation of Upper Femoral Epiphysis." Dr. J. P. Le Coque, Seattle.

"Experience with Evaporated Milk in Infant Feeding." Dr. H. C. Olmsted, Seattle.

"Traumatic Injuries to the Brain." Dr. George W. Swift, Seattle.

"Epithelioma of the Lip," with lantern slides. Dr. Charles B. Ward, Spokane.

"Harelip." Dr. H. E. Coe, Seattle.

Moving pictures. Resuscitation from Electrical Injuries.

"Hypertension." Dr. John M. Blackford, Seattle.

6:30 p.m. Informal banquet.

Entertainment by Skagit and Whatcom County Societies.

"A History of Surgical Anesthesia." Dr. Chauncey D. Leake, San Francisco.

Wednesday, Sept. 3

9:00 a.m. House of Delegates, Election of Officers.

10:00 a.m. "The Lower Bowel." Dr. Fred W. Rankin, Mayo Clinic, Rochester, Minn.

"Medical Economics." Dr. H. J. Whitacre, Tacoma.

12:00 Luncheon.

1:30 p.m. "Urology." Dr. F. Hinman, University of California, San Francisco.

"Gallbladder Disease." Dr. C. W. Sharples, Seattle.

"Seventy-five Consecutive Gallbladder Cases." Dr. J. C. Lyman, Walla Walla.

"Further Studies in the Relationship of Gallbladder and Liver Infections." Drs. J. E. Else and Millard Rosenblatt, Portland, Ore.

"Recent Advances in Preanesthetic Medication." Dr. Chauncey D. Leake, San Francisco.

"Tumors of the Spinal Cord." Dr. Darrel G. Dickerson, Seattle.

"Polyglandular Disease with Predominating Thyroid Symptoms." Dr. Ralph Loe, Seattle.

7:00 p.m. Dinner dance.

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## THE OREGON ANNUAL MEETING

The fifty-sixth annual meeting of Oregon State Medical Society, to be held at the Society's new headquarters in the Medical-Dental building, Portland, September 18-20, promises to be the largest gathering in the history of the society.

Prominent physicians from all parts of the state will participate either as officers or delegates, or in the presentment and discussion of scientific papers. There will be a number of scientific exhibits by members of the profession and institutions engaged in medical work, as well as a large number of technical exhibits, showing the latest products for the use of the medical profession. There will also be a special section on motion pictures and other demonstrations, of which several have been submitted for presentation.

The fourth annual Oregon Medical Golf Tournament at Waverly Country Club is arousing much interest among the medical golfers. The permanent trophy will again be up for competition. Dr. E. C. Joseph of Corvallis and Dr. L. S. Besson of Portland have each won a leg on the cup which must be won three times to entitle the holder to its permanent ownership. Additional prizes for the low gross score and the closest approach will be given. The participants will be entertained after the tournament with a dinner at Waverly Country Club.

The annual banquet will be held in Friday evening at the Portland Hotel. It is probable that several prominent leaders of the California Medical Association will deliver addresses on certain of the economic aspects of medical care.

Preceding the meeting, on September 16 and 17, the annual conference of county health officers will be held. The topics to be discussed at the conference will deal entirely with preventive medicine. Physicians in private practice are cordially invited to attend. All the large Portland hospitals are arranging clinics for the morning and afternoon of Wednesday, September 17, just prior to the opening of the state session on Thursday.

A preliminary program of events and papers follows:

### PRELIMINARY PROGRAM

Thursday, September 18

Morning, Registration of Delegates and Members of Scientific Session.

Afternoon, Luncheon Meeting of House of Delegates. Meeting of Women's Auxiliary.

Evening, Public Educational Meeting.

Friday, September 19

Morning, Breakfast Meeting of House of Delegates.

Afternoon, Business Session and Election of Officers. Scientific Session.

Evening, Auunal Banquet.

Saturday, September 20

Morning, Fourth Annual Oregon Medical Golf Tournament.

### TENTATIVE PROGRAM OF PAPERS

The Abdominal Symptoms of Radiculitis, Wesley E. Gatewood, Portland.

About the Clinic and Etiology of Myringitis Bullosa, E. V. Ullman, Corvallis.

The Ascheim-Zondel Pregnancy Test, Albert Mathieu, Portland.

Congenital Obstruction of the Posterior Urethra in Children, Charles D. Donahue, Eugene.

Errors Committed in Surgery of the Stomach, M. E. Steinberg, Portland.

Experimental Focal Infection in Relation to Cardiac Pathology, Noble Wiley Jones and S. J. Newsom, Portland.

Morphine-Scopolamine or Pantopon-Scopolamine in Labor, Grant S. Beardsley, Eugene.

A New Apparatus for Sinus Roentography, W. W. Baum, Salem.

Nonsurgical Treatment of Piles: A Simple Office Procedure, Banner R. Brooke, Portland.

Nutritional Allergy in Children, Helen G. Dennis, Portland.

Primary Bronchogenic Carcinoma, a Clinical and Pathologic Study, Frank R. Menne, Marr Bisaillon, and Thomas R. Robertson, Portland.

Pulmonary Tuberculosis, Marr Bisaillon, Portland.

Recent Contributions to the Study of Intestinal Obstruction, G. E. Burget, Portland.

A Statistical Study of Cancer in Oregon, J. Earl Else and Harry Watkins, Portland.

A Study of the Clinical and Pathologic Criteria Differentiating Ulcerating Carcinoma of the Stomach from Carcinoma on Ulcer and Chronic Gastric Ulcer, W. H. Bueermann, Portland.

A Study of Wound Healing Following the Employment of Various Suture Methods in Gastrointestinal Anastomosis, Karl H. Martzloff, Portland.

Surgery of the Sympathetic Nervous System, P. G. Flothow, Seattle.

Troublesome Problems in Cleft Lip and Cleft Palate Surgery, C. W. Brunkow, Portland.

Uterine Adenomyoma: A Clinical and Pathologic Study, Warren C. Hunter and John C. Adams, Portland.

# MEDICAL NOTES

Resignation of Editor's Assistant. It is with regret that announcement is made of the resignation of Dr. Harry C. Olmsted of Seattle as Assistant to the Editor of Northwest Medicine. The necessary attention to private practice has required this action to be taken.

Interstate Postgraduate Medical Association of North America will hold its annual meeting at Minneapolis, October 20-24. The preliminary program offers an extensive array of papers. There is a list of ninety-six physicians, each with the topic of his paper announced, covering all phases of medical and surgical practice. These men come from leading cities of the United States and Canada with several included from Europe. The Pacific Coast is represented by Drs. Robert C. Coffey of Portland and William J. Kerr of San Francisco. Physicians from the Pacific Northwest who contemplate an eastern trip in the fall can profitably keep this great meeting in mind. Further details of the organization are presented in the advertisement appearing on page ??.

## OREGON

Eastern Oregon District Medical Society will hold its next annual meeting August 27, at Pendleton. An interesting program has been arranged and a large attendance is anticipated. It is requested that anybody attending the meeting who desires to attend the Pendleton Roundup, August 28-30, will notify Dr. J. P. Brennan, Pendleton, in order that seat reservations and accommodation arrangements can be made.

Following is the program:

"The Surgical Treatment of Infantile Paralysis," Dr. R. B. Dillehunt, Portland.

"Pulmonary Tuberculosis," Dr. Marr Bisaillon, Portland.

"Occlusion of the Fallopian Tubes," Dr. Frank R. Menne, Portland.

"Irritable Colon," Dr. John H. Fitzgibbon, Portland.

"Prolapse of the Uterus," Dr. E. R. Watkins, Portland.

Drs. J. Tate Mason of Seattle and C. C. Sturgis of Ann Arbor, Michigan, have signified their intention of attending but have not yet submitted their subjects.

Superintendent Resigns. Miss Emily L. Loveridge, who has been superintendent for the last forty years at Good Samaritan hospital, Portland, has resigned. She will be succeeded by Miss Carolyn E. Davis, who has been superintendent of the Everett General hospital. Miss Loveridge occupies a position of respect and affection in the hearts of all Portland physicians. Her name is synonymous with Good Samaritan hospital. She has had a prominent part in the development and growth of this institution with which her memory will be abiding.

New Hospital Annex. The new addition to the Dr. Robert C. Coffey clinic and hospital at Portland was completed last month. It is a three story, fireproof building, faced with brick to harmonize with the rest of the hospital. It contains laboratories, x-ray and clinic rooms. The additional beds provide total accommodations for one hundred and twenty patients. The new building contains many of the latest details of hospital construction, each being radio-equipped and with dictograph boxes.

New Hospital to be Built. Plans have been accepted for the new St. Mary's hospital to be erected at Astoria. It will be five stories and basement, of pressed brick construction. It will contain the most modern equipment, with accommodations for seventy patients.

Reelected Trustee. At the annual meeting of the American Medical Association at Detroit, Dr. Joseph A. Pettit was reelected trustee to serve for the ensuing five years. There are seven trustees, representing all sections of the country. Dr. Pettit is the representative of the Pacific Coast.

Commissions in Medical Corps Reserve. The following physicians have accepted commissions as first lieutenants in the medical corps reserve: W. F. Beck, E. D. Pearson, D. N. McInturff, Jr., H. C. Henton, Joyle Dahl of Portland; H. A. Adix, Jr., of Gresham; R. D. Eby of Oregon City.

New Radiologist Appointed. Dr. Wallace Haworth of San Francisco has been engaged as full-time radiologist for Good Samaritan hospital, Portland. He practiced surgery in this city a number of years ago but during recent years has been radiologist in San Francisco hospitals.

Change of Army Officers. Major H. C. Mallory, medical corps, who has served for some time at Portland headquarters, has been transferred to San Francisco. He will be succeeded by Major Wm. H. Mitchell, now at Vancouver barracks.

Benton County Medical Society. Last month a new county society was organized in Benton county. Heretofore physicians of this county have maintained membership in Central Willamette Medical Society. Officers elected are Dr. W. T. Johnson, Corvallis, president, and Dr. J. H. Garnjobst, Salem, secretary.

New Nurses' Home. Pacific Christian Hospital of Eugene has leased the property formerly owned by the Delta Zeta sorority, which will be remodeled for a nurses' home.

Visit from Vienna Surgeon. Dr. Lorenz Böhler, a prominent surgeon of Vienna, visited Portland last month as well as other cities of the Northwest. He is a leading authority on the treatment of fractures, which he states have increased more than 200 per cent during the last ten years, owing chiefly to traffic accidents

Leprosy Declining. Dr. F. E. Trotter, president and executive officer of Hawaii Territorial Board of Health, visited Portland last month. Interesting work is being done at the University of Hawaii in studying the derivitives of chaulmoolgra oil and their application in the treatment of disease. Leprosy is on the decline in Hawaii, due to improvements in living conditions, sanitation and hygiene.

Dr. Eugene W. Rockey of Portland has recently returned from several months of travel and study in Italy and France. He was much impressed with the militaristic spirit in Italy. The army and militarism seem uppermost in the minds of the people. It is suggestive of future possible warfare.

Dr M. E. Corthell, who has practiced for some time at Bandon, has accepted an appointment as physician for the Federal Bureau of Education for the Copper River Valley region in Alaska. He will do both contract and private practice.

Dr. D. N. McInturff, jr., of Portland, who graduated this year from Oregon University Medical School, has been commissioned assistant surgeon of the navy and assigned to the Mare Island yard.

Dr. R. G. McCall, a recent graduate of Rush Medical College, Chicago, has located for practice at Hood River, taking the place of Dr. J. W. Sifton who has moved to San Diego, Calif.

Dr. R. H. Fields, who has practiced for a number of years at Eugene, has located at Cottage Grove.

Wedding. Dr. Joseph P. Brennan of Pendleton and Miss Willey C. Inge of Mobile, Ala., were married in the latter city on June 18.

## WASHINGTON

Basic Science Examination. The semiannual basic science examination was held at Seattle, July 12. Licenses to practice in their respective lines by all applicants were later subjects to examinations before their respective examining boards. The following table gives data from this examination.

| | Applicants | Passed | Failed |
|---|---|---|---|
| Medical | 53 | 51 | 2 |
| Osteopaths | 4 | 1 | 3 |
| Chiropractors | 9 | 3 | 6 |
| Drugless | 2 | 1 | 1 |
| Totals | 68 | 56 | 12 |

University Extension Lectures. The Medical Extension lectures of the University of Washington, held at Seattle last month, were universally considered to be of superior quality. Each lecturer delivered a consistent course of addresses on prescribed subjects, much to the satisfaction of the audiences. In the absence of Dr. Judd, lectures on surgery were delivered by Dr. Counsellor of the Mayo Clinic. The attendance was about double that of last year, about half the number being from the state outside of Seattle.

The Goiter Meeting. The annual meeting of the Association for the Study of Goiter, held in Seattle last month, brought together a large group of physicians from all parts of the country interested in the goiter problem. Papers were presented dealing with medical and surgical aspects of treatment, with citations and discussions of all phases of complications. The large variety of papers presented, together with the attendance from such widespread sections of the country, are an indication of the universal interest in this subject.

Graduate Nurses Convene. At the University of Washington in Seattle last month was held the seventh annual graduate nurses' institute in cooperation with the Washington State Graduate Nurses Association, the State Public Health Nursing Association and the League of Nursing Education. The two leading speakers were Miss Daisy Dean Urch, superintendent of nurses at Highland Hospital, Oakland, and Miss Amelia Grant, director of the Bureau of Nursing in New York City. Many matters were considered pertaining to the education of nurses, hospital and public health administration and other subjects related to nursing.

Corner Stone of Hospital Laid. The corner stone of Harborview hospital, Seattle, was formally laid July 10 under the direction of the county commissioners, Dr. Willis H. Corson, superintendent of the hospital, Rev. Mark A. Matthews and others. This new hospital is progressing rapidly, construction including the main building which will house about five hundred patients, the nurses' home and the power house. It is anticipated that the hospital will be ready for occupancy about March 1.

New Hospital Opened. The new Anacortes hospital was recently opened to the public. It is equipped to care for sixty-six patients. It is furnished with all the latest appliances for a modern hospital and will meet a long-felt want in that community.

New Head of Hospital Appointed. Dr. R. W. Brown, who has been in charge of United States Veterans' hospital at Fort Bayard, N. M., has been appointed medical officer in charge of Veterans' hospital No. 85 at Walla Walla. Dr. W. E. Park, who has been in charge of the Walla Walla hospital for the past six years, will be located at the Veterans' hospital at Fort Bayard.

New Hospital Building Completed. The recreation building of the Veterans' hospital, Walla Walla, has been completed at a cost of $100,000. This will add one hundred beds to the capacity of the institution. It is of fireproof construction with brick exterior. It contains an auditorium, as well as other provisions for entertainment and various diversions.

New Hospital Opened. The Yakima Surgical hospital has been opened at Yakima, a private residence having been transformed for this institution. Dr. Henry Storgaard, city and county health officer, is one of the incorporators of the new hospital and will supervise it.

New City-County Health Program. Steps have been taken toward the establishment of a model city and county health program at Bellingham. Dr. Simpson, of the United States Public Health Service, will direct the work for the next six months as general supervisor of health enterprises in the county and city, but will not supersede other physicians now occupying health offices.

American Public Health Association meeting for next year. The western branch of the American Public Health Association will hold its annual meeting next year in Seattle. This location was decided upon through the efforts of Dr. E. T. Hanley, Seattle commissioner of health, who was chosen first vice-president of this organization at its recent annual meeting at Salt Lake City.

Reelected President. At the meeting of the Washington Society for Mental Hygiene, held in Seattle last month, Dr. Donald A. Nicholson of that city was reelected president, Dr. C. W. Sharples being chosen chairman of the executive committee.

Appointed Vice-Chairman. Dr. C. F. Eikenbary of Seattle was appointed vice-chairman of the orthopedic section of the American Medical Association at its annual meeting in Detroit. He will be in line of chairmanship the following year.

**President of Tuberculosis League.** Dr. W. B. Penney, Tacoma, was reelected president of Pierce County Tuberculosis League at its annual meeting in Tacoma June 25. He has already served for seven years in this capacity.

**Dr. George W. Overmeyer,** who has for some time been connected with Shipherd's Springs on the Columbia River, and has also practiced at Stevenson, has become medical advisor for the Old Soldiers' Home at Port Orchard. This leaves Stevenson and the county without a doctor.

**Dr Jay I. Durand,** Seattle, sailed last month for Europe on a three months' business and pleasure trip. He will attend the International Congress of Child Specialists at Stockholm.

**Dr. Lewis J. Farrell,** recent graduate of Rush Medical College, has located at Everett, where he will be associated with Dr. J. Warren Bell.

**Dr. Harmon A. Rhoades,** of Everett, has sailed for Europe where he will spend the next three months studying eye, ear, nose and throat work at Paris and Vienna.

**Dr. Norman Mace,** a recent graduate of University of Oregon Medical School, has located at Elma, where he will be associated with Dr. A. A. Foote.

**Dr. Halliday,** who has recently completed service at Deaconess hospital at Spokane, has located for practice at Winchester. He will take over the practice of Dr. J. F. Gist who will spend some time in eye, ear, nose and throat study in New York and Vienna.

**Dr. John W. Schori,** who has recently completed an internship at King County hospital, Seattle, has located for practice at Spirit Lake. He will take over the practice of Dr. N. Hersey which he formerly conducted at Spirit Lake hospital.

**Dr. Paul Ellis,** who has recently interned at St. Luke's hospital, Spokane, has located for practice at Wallace, where he will be associated in practice with Dr. M. T. Smith.

**Dr. R. L. Arms,** who has been the head of Bonneville county health unit for the past six months, has left Idaho Falls for Maine, where he will take up work of a similar character.

**Dr. F. L. Peterson,** who has practiced at Salt Lake City, has located at Cottonwood. He will be associated in practice with Dr. Orr.

## OBITUARIES

**Dr. Wylie G. Woodruff,** of Portland, Ore., died June 21, aged 64 years. He was born in Tecumseh, Neb., in 1866. He was a graduate of the University of Pennsylvania in 1897, where he attained eminence in athletics as well as scholarship. He was distinguished as a football player, oarsman, wrestler, hammer thrower and in track work. After graduation he located at Lawrence, Kan., where, in addition to practice of medicine, he coached the football team at the state university. He was also football coach at Haskell Indian school for two years. During the Spanish-American war he was in command at Fort Riley, Kan. After termination of the war he located in Portland. In 1910 he organized the Oregon Sanatorium, which he conducted at the time of his death.

**Dr. John S. Kloeber** died at Yakima, Wash., July 15, after a long illness, aged 65 years. He was born in Baltimore, Md., in 1865. He was a graduate of University of Virginia and received his medical degree from University of Maryland in 1888. He practiced at Kenosha, Wis., and located in Seattle in 1890. Besides the practice of medicine, he was active in civic affairs, serving a term as president of the city council. For several years he owned and managed a sanitarium at Green River Hot Springs near Lester. For the past twenty years he has lived at Selah, adjacent to Yakima. He was a leading orchardist, managing a fruit orchard of 100 acres, where he maintained a beautiful, hospitable home. For two years he served as president of the state fair commission.

**Dr. George T. Penn,** of Ritzville, Wash., died suddenly from disease of the heart June 21, aged 66 years. He was born in Marion county, Missouri, in 1864 and received his early education in the public schools of Kansas. He graduated from Northwestern University Medical School in 1890 and immediately located for practice at Spokane. While there he was active in civic affairs, serving as a member of the school board from 1897 to 1904. In 1926 he located at Ritzville, where he was in general practice until the time of his death.

**Dr. Charles E. Linton** died at Waldport, Ore., June 21, aged 65 years. He was born in Iowa in 1865. He had resided in Oregon for forty-one years. In addition to medical practice he had for many years been proprietor of a pharmacy. He was the author of a number of books of fiction, by reason of which he gained the title, "The Jules Verne of Oregon."

**Dr. Ross W. Weyer,** of Orting, Wash., died at Puyallup Valley hospital June 30 from pneumonia. He formerly practiced for a number of years in Yakima and from there located in Tacoma. For the past four years he has been in general practice in Orting, beside acting as official medical aid to the State Soldiers' Home.

**Dr. Alexander F. MacLeod** died at Spokane, Wash., June 30 from pneumonia, aged 82 years. He was born in Nova Scotia in 1848, where he received his early education. He obtained his medical education at the University of Michigan. In 1880 he located for practice at Spangle, later moving to Farmington. He located at Spokane in 1893, where he was in active practice until four years ago.

**Dr. A. M. Warren,** of Bellingham, Wash., died July 4 as the result of prolonged exposure to roentgen rays, aged 48 years. He graduated from Sioux City College of Medicine in 1902. Formerly he practiced in Montana and located in Bellingham in 1925.

**Dr. F. W. Comings** died at Eugene, Ore., July 3, aged 73 years. He graduated from University of Vermont Medical College in 1886. He practiced in Vermont until 1908, when he located at Eugene. He recently started East for a visit in his Vermont birthplace but was taken seriously ill on the train, later returning to Eugene.

# CORRESPONDENCE

## KING COUNTY MEDICAL SOCIETY AND CONTRACT PRACTICE

To the Editor:

Seattle, Wash., July 17, 1930.

Considerable misunderstanding prevails throughout the state regarding the recent action by King County Medical Society in relation to contract practice. The scope of the investigation and action was limited to three points: (1) The attack on present practices under the contract alternative, provided by the present medical aid law, as unsound financial and unsound health policy. (2) Attack on the "medical contract" executed by certain contract doctors, supplementing their Medical Aid Law contracts. (3) Attacking the practice of using hired lay solicitors, or of physicians themselves indulging in commercial solicitation to procure professional business, especially the contracts mentioned in items (1) and (2).

The contract alternative provided under the medical aid law was declared unsound financial policy because all moneys appropriated for actual care of the injured is placed in the hands of the contract doctor. From the funds held in trust by him he pays himself for his professional services; also he acts as custodian, administrator and disburser of funds appropriated for all supplementary services, hospital, nurses, drugs, appliances and even for consultation by specialists. This provision results in a health policy of possible tragic detriment to the men engaged in hazardous industry in the state of Washington. Men under contract are treated inadequately and inefficiently in order that the contract may be more profitable financially.

The "medical contract" written to supplement the medical aid law contract assumes for about seventy cents to one dollar and twenty-five cents a day to cover all services and all the expenses incurred in case of accident not covered by the medical aid law, and in case of illness of every kind with few specific limited exceptions. This contract is in reality a limited health insurance policy. It is essentially wild cat in character and constitutes poor health policy. The contract doctor is the insurer. He is wholly unsupervised. Legalized insurance carriers are supervised by the Department of Insurance. He is not required to show financial resources as are legalized insurance carriers, nor is he under bond or authority which requires him to fulfill the contract. These contracts are executed, not in the interest of better health services to the insured but solely as a scheme to increase clientele more rapidly or in greater volume than is possible by legitimate means. Inadequate or inefficient service is the rule under the contract plan.

That these two types of contracts are valuable is proved by the fact that the contract doctors hire lay solicitors, paying them as much as twenty per cent of the gross revenue, and in addition making large outlay in cash or articles of value, such as automobiles promised to subordinate executives for their services in securing the necessary consent of the workmen. Thus considerable funds intended for services to workmen are diverted to commercial channels. Medical services become subject to barter and sale.

The use of hired lay solicitors either direct or through a company, agency or institution used to disguise the fact is against public policy and is, therefore, condemned unconditionally in the code of ethics of the American Medical Association. The code of ethics of the American Bar Association is incorporated in the legal practice act in this state, and lawyers are disbarred if convicted of using paid lay solicitors. The Supreme Court has pronounced the practice to be against public policy. It is equally against public policy as related to the medical profession and revocation of license should be the penalty paid by a doctor guilty of that offense.

King County Medical Society passed resolutions, criticizing practices under the contract alternative provided by the medical aid law, and pledged itself to an effort to correct the evils flourishing thereunder. It condemned the medical contract supplementing the medical aid law contract as unsound health policy and will make an effort to abolish the practice or to bring it under the supervision of the insurance department, where it properly belongs if the practice continues. The society condemned the practice of using hired lay solicitors, or of physicians themselves indulging in commercial solicitation to secure professional business and will expel members found guilty of the practice.

H. T Davidson, M.D.

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**Tuberculous Pleurisy.** Gerald B. Webb, Colorado Colo. (*Journal A. M. A.*, July 5, 1930), stresses the fact that at adolescence a pleurisy will often have revealed the impregnation of tubercle and it will only be a few years later that the pulmonary localization will manifest itself. In some cases pulmonary disease will light up ten to twenty years later and subjects of pleurisy in youth may not become phthisic until mature or old age. Tuberculous pleurisy may be acute or chronic. The acute form may be dry or accompanied by a serofibrinous and, at times, hemorrhagic fluid. Pleurisy with effusion can persist, occasionally, in spite of treatment, for a year or more. The condition is not infrequently bilateral. It is a frequent concomitant of artificial pneumothorax when the onset may be accompanied by a high and lasting fever in some patients. Tuberculous pleurisy in general arises from a subpleural tubercle deposit, and the inflammatory condition is a result of allergy. Following a pleurisy with effusion the original lung focus may, by roentgen study, seem to have disappeared. Acute tuberculous pleurisy may arise insidiously in children and adults, without pain and at times without apparent fever. In the majority of patients, however, there is marked fever and definite pain. A simple test, and at times useful, which Webb suggested for diaphragmatic pleurisy is to order the patient to lie on the affected side. In such a position the recumbent diaphragm at first makes an increased excursion and this intensifies the pain of diaphragmatic pleurisy. In general, the symptoms of tuberculous pleurisy may simulate those of pulmonary tuberculosis; namely, a dry unproductive cough, malaise, fever, accelerated pulse and digestive disturbance. The latter is at times most marked when pleurisy with effusion occurs on the left side. Judging by the large number of pleuritic adhesions found at autopsies, pleurisy must be overlooked often when it is present. All chest pain and pain referred to the shoulders, arms and abdomen should lead a physician to suspect pleurisy. Sometimes such pains may originate from diseased tonsils and teeth. Cystic breasts in women, certain heart conditions, herpes zoster, gastric and spinal disease, and other possible causes may produce chest pains. Percussion is of great service in detecting change of resonance, and percussion with the tips of all four fingers should be used over the lung bases. Auscultation enables the physician to detect quiet breathing and the pleuritic rub. Rest, by means of strapping and posture, and heat, by means of an electric pad, are the best symptomatic methods of treatment.

# REPORTS OF SOCIETY MEETINGS

## IDAHO STATE MEDICAL ASSOCIATION

## PROCEEDINGS OF THE THIRTY-EIGHTH ANNUAL MEETING OF IDAHO STATE MEDICAL ASSOCIATION, COEUR D'ALENE, IDA., JUNE 27-28, 1930.

### HOUSE OF DELEGATES

### First Session

July 26, 9 p.m.

Meeting called to order by the president, Dr. H. D. Spencer.

Roll call. Members present as follows:

H. D. Spencer, President; D. E. Cornwall, President-and Councilor North District; J. N. Davis, Secretary-treasurer; J. L. Stewart, Councilor West District; W. A. Koelsch, Delegate Southwestern Idaho Medical Society; Harold W. Stone, Delegate Southwestern Idaho Medical Society; John F. Coughlin, Delegate South Side Medical Society; H. E. Lamb, Delegate South Side Medical Society; S. A. Swayne, Delegate Canyon Medical Society; Alexander Barclay, Delegate Kootenai Medical Society.

The following committees were appointed:

Credentials, Doctors Barclay, Stewart and Stone.

Resolutions, Doctors Swayne, Cornwall and Lamb.

### Report of Secretary-treasurer

### Report of Certified Accountant

June 23, 1930.

J. N. Davis, Secretary-treasurer,
Idaho State Medical Society,
Kimberly, Ida.

Dear Sir:

As requested by you I have audited the membership dues as credited to the members on the cards and also as to deposits in the bank. Dues of Howard Rouse $20 for 1930, and A. R. Cutter for 1929 were not entered on the books but were deposited in the bank. H. P. Belknap was credited twice in 1929. One of these was evidently dues of Jos. E. Otte as the records show him to have paid, but there is no entry on the books.

I have made a list of Delinquent Members but have not set up any Membership Fees Receivable, as on the previous report, for the reason that there is nothing compulsory about the payment of dues and therefore they constitute a very doubtful Asset.

The Statement of Receipts and Disbursements and the Balance Sheet are made after taking into consideration the above mentioned corrections and show a correct condition of the accounts as of this date.

Very truly yours,
J. C. Osgood.

### Balance Sheet as of June 23, 1930

| | |
|---|---|
| *Assets* | |
| Cash in bank | $3,427.75 |
| Post Dated Checks | 100.00 |
| | $3,527.75 |
| *Liabilities* | |
| Legal Reserve | $ 151.90 |
| County Societies Reserve | 229.00 |
| Medical Defense Reserve | 315.75 |
| Surplus | $2,831.10 |
| | $3,527.75 |

### *Reconciliation of Surplus*

| | | |
|---|---|---|
| Surplus as of June 30, 1929 | | $3,592.07 |
| Deduct: | | |
| 1928 Membership Fees | $ 430.00 | |
| 1929 Membership Fees | 1,544.00 | |
| Paul Davis Account | 200.00 | 2,174.00 |
| | | 1,418.07 |
| Gain in Receipts over Disbursements | | 1,413.03 |
| Surplus as of June 23, 1930 | | $2,831.10 |

### Statement of Receipts and Disbursements as of June 23, 1930

| | | |
|---|---|---|
| *Receipts* | | |
| On hand June 30, 1929 | $1,188.22 | |
| 1929 Dues Received | 1,096.00 | |
| 1930 Dues Received | 3,967.00 | $6.251.22 |

**Membership by Counties**

| Component Societies | No. of Counties in Each Component Society | No. of Active Physicians in Each Component Society Area | Membership, July 1, 1929 | Total Membership, 1929 | Membership July 1, 1930 | Per Cent of Total Physicians in State | Per Cent of 1929 Total Membership | Per Cent of July 1, 1929 Membership |
|---|---|---|---|---|---|---|---|---|
| Bonner County | 2 | 10 | 2 | 2 | 1 | 10 | 50 | 50 |
| Canyon County | 1 | 29 | 14 | 18 | 12 | 41.4 | 66.6 | 85.7 |
| Idaho Falls | 1 | 13 | 10 | 11 | 12 | 92.3 | 109 | 120 |
| Kootenai County | 1 | 14 | 5 | 8 | 5 | 35 | 62.5 | 100 |
| Nez Perce County | 3 | 35 | 16 | 18 | 13 | 37 | 72 | 87.5 |
| Pocatello | 9 | 57 | 25 | 26 | 19 | 33.3 | 73 | 76 |
| Shoshone County | 1 | 14 | 7 | 8 | 7 | 50 | 87.5 | 100 |
| Southwestern Idaho | 9 | 81 | 21 | 29 | 28 | 34.5 | 96.5 | 133.3 |
| South Side | 8 | 51 | 22 | 24 | 21 | 41.2 | 87.5 | 95.4 |
| Tri-County | 3 | 17 | 10 | 11 | 11 | 65 | 100 | 110 |
| Upper Snake River | 6 | 19 | 7 | 8 | 2 | 10.5 | 25 | 28.6 |
| Totals | 44 | 340 | 139 | 163* | 131 | 38.5 | 80.4 | 94.2 |

* 47.92 per cent of total number of active physicians in the state.

| *Disbursements* | | |
|---|---|---|
| Salaries Payable | $ 220.00 | |
| Rent Payable | 30.00 | |
| Salaries | 683.00 | |
| Printing | 316.64 | |
| Traveling | 55.50 | |
| Rent | 60.00 | |
| Periodicals | 361.00 | |
| Office Expense | 174.67 | |
| Telephone and Telegraph | 59.45 | |
| Janitor | 18.00 | |
| Emergency Fund | 487.21 | |
| Refunds to County Societies | $ 258.00 | $2,723.47 |
| Balance on Hand June 23, 1930 | | $3,527.75 |
| *Receipts Apportioned* | | |
| General Fund | | $4,724.50 |
| Local Societies | | 241.00 |
| Medical Defense | | 97.50 |
| | | $5,063.00 |

BANK RECONCILIATIONS AS OF JUNE 23, 1930

| | | |
|---|---|---|
| Balance on Hand June 30, 1929 | | $1,188.22 |
| Deposits | | 4,963.00 |
| | | $6,151.22 |
| Disbursements | | 2,723.47 |
| Balance per Books | | $3,427.75 |
| Less Deposit not on Bank Statement | | 140.00 |
| | | $3,287.75 |
| Checks Outstanding: | | |
| No. 80—J. O. Mellon | $5.00 | |
| No. 140—Bonner Co. Med. Soc | 2.00 | |
| No. 240—Bonner Co. Med. Soc | 4.00 | $ 11.00 |
| | | $3,298.75 |
| Exchange and Telegram Charged by Bank —not on books | | .73 |
| | | $3,298.03 |

In addition to my report on membership and finances I wish to call your attention to the following items:

1. The report of the Tuberculosis Committee and the urgent need of an active committee in this field during the coming legislative year.

2. The probable introduction of a bill in the coming legislature to regulate the present nonlicensed healers and quacks and the use of electrotherapeutic measures.

3. The need of an amendment to our by-laws regarding the delinquency date, and such an amendment is herewith made.

4. The need of graduate lecture work for the component societies or districts.

Amendment No. 7. Sec. 14 of Chapter LX of the By-laws of the Idaho State Medical Association shall be amended to read as follows:

Any county society which fails to pay its assessment, or make the report required, on or before the first day of March shall be held as suspended and none of its delegates or members shall be permitted to participate in any of the business or proceedings of the Association or the House of Delegates until such requirements have been met, and its members shall be dropped from the roll of the Association the first day of April following.

This constituted the first reading of the proposed amendment.

Adjourned to meet at the call of the Chair.

### SECOND SESSION

June 28

Called to order by the president, Dr. Spencer.

Roll call. Members present:

H. D. Spencer, President; D. E. Cornwall, President-elect and Councilor North District; J. N. Davis, Secretary-treasurer; J. L. Stewart, Councilor West District; W. A. Koelsch, Delegate Southwestern Idaho Medical Society; H. W. Stone, Delegate Southwestern Idaho Medical Society; H. E. Lamb, Delegate South Side Medical Society; J. F. Coughlin, Delegate South Side Medical Society; S. A. Swayne, Delegate Canyon County Medical Society; F. C. Gibson, Delegate Tri-county Medical Society; A. Barclay, Delegate Kootenai County Medical Society.

The Credentials Committee reported all delegates present properly accredited.

Properly moved and seconded that the report of the committee be accepted and the committee discharged. Carried.

### Report of Resolutions Committee

Resolution No. 1

WHEREAS, the Antituberculosis Association is maintaining a very efficient health camp at Couer d'Alene for the care and education along the lines of better health of undernourished and underprivileged children and has a definite program for the establishment of similar camps in various parts of the state, now therefore be it

RESOLVED, that the Idaho State Medical Association show its appreciation of these laudable efforts by urging the public to support in every way and to its fullest extent the aims and objects of the Antituberculosis Association to the end that tuberculosis in this state be cut to the minimum and the man-power of the state conserved to the fullest extent.

Resolution No. 2

WHEREAS, it is our opinion after a careful study of the situation extending over a period of more than ten years, that the Harrison Narcotics Act has failed of its purpose in the following particulars:

1. It has not curtailed the improper use of narcotics to any appreciable extent,

2. It has driven the habitue into the hands of the unscrupulous smuggler of these drugs,

3. The secrecy entailed by No. 2 defeats one of the purposes of the Act in that Government has now lost all count and record of habitues except those few who are undergoing systematic treatment or those who have fallen into the hands of the law through crime or vagrancy,

4. The Harrison Narcotic Act was conceived under a misconception of actual conditions affecting the very people whom it purposes to assist and instead of *treating* these unfortunates in a humane and intelligent manner in the effort to cure their *disease*, has attempted to remedy conditions in a brutal and unscientific determination to control a *vice*. Now therefore be it

RESOLVED, that the Idaho State Medical Association, at its 38th annual convention, express it strong condemnation of this basically unsound and ignorantly conceived illogical law, the Harrison Narcotic Act; that we spread these resolutions upon the minutes of our meeting and that we send copies thereof to our representatives and senators in Congress and ask their earnest activities to the end that this Act be repealed.

Resolution No. 3

1. Whereas, the members of the Idaho State Medical Society attending the 38th annual meeting in Coeur d'Alene have greatly enjoyed the fine hospitality of the Kootenai Medical Society and the City of Couer d'Alene;

2. Whereas, it has been noted by the members of the Idaho State Medical Society that the physicians of this city and surrounding territory are very actively interested in public health and other civic activities, particularly anti-tuberculosis work, Boy Scout and Girl Scout camps and general community welfare;

3. Whereas, the ladies of the city of Coeur d'Alene, Kootenai County, and surrounding territory have magnificently entertained the ladies auxiliary of the Idaho State Medical Association and contributed greatly to the pleasure of the meeting of the Society in this city, therefore, be it hereby

Resolved, that the Idaho State Medical Society expresses its deepest appreciation of the hospitality and entertainment afforded on this occasion and that the work of the physicians in this county and surrounding territory in their public and civic activities and their deep interest in public welfare generally be most highly commended, and that on behalf of our visiting ladies we extend our deepest appreciation to the ladies of Coeur d'Alene and Kootenai County for the charming manner in which we have all been received and entertained.

Moved by Dr. Barclay, seconded by Dr. Coughlin, that the report of the Resolutions Committee be accepted and the committee discharged, and the adoption of the resolutions as read. Carried unanimously.

Signed, Resolutions Committee.
Dr. S. A. Swayne
Dr. D. E. Cornwall
Dr. H. E. Lamb

**Report of Nominating Committee**

President-elect, Dr. J. N. Davis, Kimberly.

Secretary-treasurer, Dr. H. W. Stone, Boise.

Councilor North District, Dr. F. C. Gibson, Potlatch.

Standing Committees: Scientific, Dr. A. C. Jones, Boise; Dr. D. L. Alexander, Twin Falls. Public Health and Legislation, Dr. F. W. Almond, Boise; Dr. E. N. Roberts, Pocatello; Dr. Alexander Barclay, Coeur d'Alene.

Moved by Dr. S. A. Swayne, seconded by Dr. A. Barclay, that the rules be suspended and the report of the Committtee on Nominations be accepted, and the secretary be instructed to cast the unanimous vote of the House of Delegates for the officers named therein. Carried.

Moved by Dr. H. W. Stone, seconded by Dr. H. E. Lamb, that the dues for the coming year (1931) be fixed at Twenty ($20) Dollars. Carried.

Dr. J. L. Stewart extended the invitation of Boise for the 1931 convention. Moved by Dr. Barclay, seconded by Dr. Coughlin, that the invitation be accepted. Carried.

Second reading of Amendment No. 7. The Chairman called for vote on this amendment. Passed without a dissenting vote. Adjourned sine die.

J. N. Davis, M.D., Secretary-treasurer.

# BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

The Chest. Annals of Roentgenology. A Series of Monographic Atlases. Edited by James T. Case, M.D. Volume Eleven. By L. R. Santé, M.D., F.A.C.P. Professor of Radiology and Director of Department, St. Louis University Medical School, etc. 376 Roentgen-ray Studies and 163 Clinical Illustrations. 561 pp. Cloth. 8½x11 inches. $20.00. Paul B. Hoeber, Inc., New York, 1930.

This volume is one of a series of monographic atlases covering practically the whole body, so far as it is susceptible to roentgenologic study. The series is unique and of great permanent value and constitutes a veritable classic in medical literature. Like anatomic treatises, this series differs from most medical contributions in being good for all time because roentgenograms represent actual pathology which does not vary with the passing fads and fashions of the period.

The volume under consideration is indeed a magnificent work and of absorbing interest to all those who concern themselves with diagnosis of lung and heart diseases. The book contains chapters on methods of roentgen-ray examination, roentgen-ray anatomy of the chest, and on principles of roentgenologic interpretation. Part II has chapters on roentgen-ray evidences of disease in the bony framework of the chest, in the mediastinum, in the hilum shadow, peribronchial markings, in variations in density in the lungs and in the diaphragmatic shadow.

Part III treats of roentgenologic evidences of diseases of the larynx, trachea, bronchi, lungs, including pneumonias, tuberculosis in various forms, syphilis, pneumoconiosis, atelectasis, new growths and injuries to chest with resulting lesions. Then follow diseases of the pleura, including dry pleurisy, effusions, pneumothorax and new growths. Next come diseases of the mediastinum, embracing mediastinitis, thymus, substernal goiter, aortitis, aneurysm, new growths, esophageal disease, adenopathy, tuberculous abscesses and free fluid. The book ends with roentgenologic portrayal of diaphragmatic abnormalities, as eventration and hernia, subdiaphragmatic abscess, adhesions and paralysis.

The use of a great number of diagrammatic pictures of chest conditions in order to make clear the essential points in roentgen-ray diagnosis cannot be too strongly commended. These enable us to look at once for the pathognomonic signs in the much more complicated roentgenograms of the living pathology. For instance, no pulmonary disease has perhaps attracted more attention of late than atelectasis and diagnosis depends chiefly on roentgen-ray findings. On page 129 will be found diagrams showing the roentgenologic differential features between pneumonia, pleurisy with effusion, atelectasis and new growths of the lungs. The high diaphragm, the narrowed lung area and the drawing of the heart and mediastinal structures toward the collapsed lung are characteristic of ateclectasis and it is surprising how many pneumonias have become atelectases since roentgenology has determined the correct pathology. Ateclectasis of a portion of a lung from total occlusion of a bronchus, and emphysema of the lung from partial obstruction of a bronchus are beautifully shown in roentgenograms. The roentgen-ray study of bronchiectasis and abscess is admirable, as also that of new growths.

As a reference book this work is absolutely invaluable for the roentgenologist, internist, lung specialist and for those doing lung or chest surgery. The reproductions of roentgenograms are excellent, and the descriptions and differential diagnosis are masterly by one of the leading authorities in the country. Altogether it is a splendid contribution to clinical medicine and reflects great credit on editor, author and publisher alike. WINSLOW.

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VENEREAL DISEASE. Its Prevention, Symptoms and Treatment. By Hugh Wansey Bayly, M.C. Fourth (American) edition with three colored plates and 74 illustrations in the text. $3.50. F. A. Davis and Company, Philadelphia, 1930.

This small volume covers in a creditable manner the prevention, symptoms and treatment of venereal diseases. Section I is devoted to a discussion of the most effective methods of prevention, emphasis being made on immediate self-disinfection since it was conclusively proven during the World War that this will greatly diminish the incidence of venereal disease. Section II covers briefly the subject of syphilis with the author's method of treatment. Section III is concerned with gonorrhea in both male and female. Sections IV and V are both quite short and in them are taken up the nonspecific lesions and the author's own method of office treatment, case histories and so forth. By avoiding as much as possible all controversial matter and theory, the author has succeeded in producing a small volume containing no small amount of easily available information. It is a valuable book for anyone treating venereal diseases. R. T. SCOTT.

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CLINICAL FEATURES OF HEART DISEASE. An Interpretation of the Mechanics of Diagnosis for Practitioners. By Leroy Crummer, M.D., Emeritus Professor of Medicine, University of Nebraska. Introduction by Emanual Libman, M.D., Professor of Clinical Medicine, Columbia University. Second Edition Revised and Enlarged. 388 pp. $4.00. Paul B. Hoeber, Inc., New York, 1930.

An up-to-date, common sense book, written evidently by an older clinician, containing much wisdom. The chapter devoted to "Inspection" gives a wealth of information, reminding one of the lectures of that master clinician von Neusser of Vienna. A few of the author's ideas, notably his warning against tonsillectomy during acute endocarditis will be universally approved. The chapter on treatment is excellent, and he entertains no delusions regarding the numerous remedies to cure incurable heart conditions. The book will be read with pleasure and profit by both young and old physicians. VONPHUL.

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PHYSICAL DIAGNOSIS. By Richard C. Cabot, M.D. Professor of Clinical Medicine in Harvard University. Formerly Chief of the West Medical Service at Massachusetts General Hospital. Tenth Edition. Revised and Enlarged, with 6 Plates and 279 Figures in the Text. Cloth. 529 pp. $5.00. William Wood and Co., New York, 1930.

It is a great pleasure to see each new edition of this work which has been a standard textbook on the subject now for exactly a quarter century, during which time Richard Cabot has been one of the greatest outstanding teachers of clinical diagnosis in this country, and might be called the great medical iconoclast, as he has been the means of breaking down many medical images or false beliefs. He achieved fame as an interne as an autopsy hound in being able to retrieve any organ in the body, except the brain, per rectum in cadavers when ordinary autopsy was refused. His book on microscopy of the blood was the first textbook in English on the subject. His two volumes on "Differential Diagnosis" constituted our best and most popular reference book on this subject until the monumental work of Herbert French appeared.

Cabot has always taken the large clinical view in diagnosis and, although beginning as a technical laboratorian himself in his blood work, he has in later years become great through his broad clinical views. He shattered the former narrow microscopic diagnosis made from urinary sediments by showing that many cells thought to be derived only from certain parts of the urinary tract were found in many parts, as the cordate cells formerly sacred to the pelvis of the kidney but present also in the deeper layers of the bladder mucous membrane. He went farther and proclaimed that the chief points of diagnostic importance in the urine were color, amount and specific gravity, ignoring all the finer, meticulous criteria built up by the moguls of urinary chemistry and microscopy. Thus he showed the enormous errors made by the best internists in the diagnosis of interstitial nephritis before the days of the sphygmomanometer and blood chemistry.

In his work on the heart he first simplified classification and demonstrated the common error of attributing pathologic significance to systolic murmurs heard at the apex in the absence of enlargement of the heart and a rheumatic history, also the falsity of mitral insufficiency as a pure clinical entity in the absence of stenosis. His book on "Facts on the Heart" is the culmination of his great experience, clinical and pathologic. Cabot's work can seldom be gainsaid, since it is based on the incontrovertible evidence of clinical and autopsy findings.

It is strange, since he was first in the field to emphasize the importance of specific gravity in urinary examinations, that he does not give the most valuable concentration test in this book. Also, while admiring his broad clinical outlook, he seems to go too far when he states on page 373, "In my own practice I have nearly discarded test meals and chemical analysis," and again, "HCl is normal or subnormal in three-fourths of the cases of peptic ulcer." The great clinical significance of anacidity or hyperacidity in digestive disorders cannot be denied, especially as regards treatment. For instance, the diarrhea due to achlorhydria and clinical symptoms due to hyperacidity. Sippey found that 50 per cent of cases of peptic ulcer had hyperacidity, while Rehfuss in 100 cases of duodenal ulcer discovered 78 per cent hyperacidity; in gastric ulcer 57 per cent had normal or subnormal acidity and 10 per cent had achlorhydria. Hyperacidity seems, therefore, more characteristic of duodenal ulcer and bears out Moynihan's famous dictum that "hyperacidity is duodenal ulcer." More impressive than true, however, as Sansum recently reported forty cases of hyperacidity in which there were only four cases of ulcer.

This new edition is not changed in its general character of teaching the fundamental matters relating to physical diagnosis from the clinical standpoint. It emphasized the essential and ignores the more meticulous and often misleading laboratory findings that bulk so largely in most other books on the subject. This very basal, clinical quality

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is what makes the book a classic and ensures its permanency as the leading text book on the subject in its tenth edition and quarter century of existence. The additions are few, relating to coronary disease, electrocardiography, cancer of the lung, cardiac asthma, encephalitis and toxic hepatitis. The last must have been accidentally omitted, since it is not to be found in the index or in the article treating of jaundice and the liver. WINSLOW.

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NORMAL FACTS IN DIAGNOSIS. By M. Coleman Harris, M.D., Lecturer on Physical Diagnosis, New York Homeopathic Medical College and Flower Hospital; and Benjamin Finesilver, M.D., Lecturer on Diseases of the Nervous System, New York Homeopathic Medical College and Flower Hospital. 42 Engravings, some in Colors. Cloth. 247 pp. $2.50. F. A. Davis and Co., Philadelphia, 1930.

This little book attempts to separate the pathologic facts from the normal in physical diagnosis and to present the latter in their purity. The authors deplore the intermixture of normal and abnormal facts in most books on physical diagnosis, feeling that the student is thereby unable to differentiate the normal from the abnormal. As a matter of fact, normal and abnormal signs are so inextricably bound together that it is impossible to teach one without the other. For example bronchial, tracheal and bronchovesicular breathing are heard normally in some parts of the chest, and yet what would be normal sounds heard at the right apex would indicate pathology when found at the left. It seems by long experience best to teach normal as contrasted with abnormal physical signs, and these fortunately are often found together in the same individual in different parts of the body, as in the lungs or abdomen. But the actual presentation of the normal facts as found in this book is absurdly inadequate and often wholly erroneous.

What can be taught of the normal heart sounds in four pages with the informative comment that "any abnormality in their sound, rate, rhythm or force indicates a pathologic condition." Some such partial knowledge was responsible for the thousands of patriotic soldiers who were found disabled by draft boards during the World War, owing to the presence of heart murmurs which incapacitated the possessors less than squeaks in the soles of their boots.

The so-called "Normal Facts in Diagnosis" in this book are in many cases abnormal or erroneous, as noted above. Thus, in regard to cholecystography the writers show abysmal ignorance. It is stated that tetraiodophenolphthalein is used as a dye (presumably the sodium salt) and that "one gram of the dye is necessary to yield a gallbladder shadow in a normal person. Where two grams is required, one is probably dealing with a pathologic gallbladder." We will not comment on the grammar, which is reminiscent of the Amos and Andy "is been," but merely say that the standard dose of the dye for cholecystography is composed of four grams of sodium tetraiodophenolphthalein by the mouth. Then, "the normal gallbladder fills with the opaque dye and yields an even shadow." One receives the impression that the dye pours into the gallbladder with the bile and thus gives us the "even shadow." Irregularities of contour are of no significance, and the fact that the presence of the dye is chiefly a measure of the concentrating ability of the mucous membrane of the gallbladder is not noted, and that it is a criterion of gallbladder function. Also that in twenty per cent of cases the function as measured by the dye is normal when the gallbladder is diseased. Perhaps this latter fact would be too inappropriate as confusing the student with the usual perplexing mixture of normal and abnormal facts in physical diagnosis.

To the reviewer there is no sufficient *raison d'etre* for this would-be contribution to the literature of physical diagnosis, when we have excellent standard works in existence which teach not only the normal but abnormal facts in one volume and in a trustworthy manner, without causing notable confusion in the minds of the average medical student. WINSLOW.

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THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 14, Number 1. (University of California Number, July, 1930.) Octavo of 278 pages with 54 illustrations. Per clinic year, July 1930 to May 1931. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1930.

Lewellys F. Barker, of Johns Hopkins University, was the first visiting lecturer at University of California Medical School. During November and December, 1929, he was an active member of the medical faculty, taking part in ward rounds and clinicopathologic conferences and giving amphitheater clinics. This volume comprises reports of his clinics during that period. First is an address on the "Dangers of Neglect of Accuracy in Physical Examinations," which every physician could read with profit. The amphitheater clinics cover a variety of diseases presented in a most attractive manner with abundant illustrations. The clinic reports include various phases of anemia, several on amebic dysentery, cirrhosis of the liver, diabetes and other subjects. The clinicopathologic conferences also cover a great variety of diseases, the reading of which is of interest and profit. The host of physicians who have come in contact with Dr. Barker's fascinating personality will read these reports with great interest and profit.

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THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 10, Number 3. (New York Number—June 1930.) Octavo of 265 pages with 123 illustrations. Per Clinic Year, February 1930 to December 1930. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1930.

This volume features clinical reports from leading New York surgeons. Lilienthal and Honan each discuss certain phases of pulmonary surgery. There are interesting reports of operations on the genitourinary tract, various conditions of the intestinal tract and other abdominal organs. Fractures also are considered by a number of writers. Many other interesting discussions are presented in this volume.

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INEFFICIENCY OF METAPHEN AS SKIN DISINFECTANT. The recently published experiments of Raiziss, Severac and Moetsch, showing that metaphen in strengths of from 1:500 to 1:2,500 invariably sterilizes inoculated rabbit skin, are invalid because the amounts of drug transferred to the subcultures have been shown to be sufficient to inhibit bacterial growth. Metaphen 1:500, tested by a valid method, with exposure for five minutes and subsequent drying, cannot, according to the experience of Edwin C. White and Justina H. Hill, Baltimore (*Journal A. M. A.*, July 5, 1930), be relied on regularly to sterilize normal human skin.

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## ORIGINAL CONTRIBUTIONS

### A THIRD TYPE OF TOXIC THYROIDISM*

C. A. Roeder, M.D.
OMAHA, NEB.
AND
W. A. Killins, M.D.
GREEN BAY, WIS.

In this paper we desire to use the term "toxic thyroidism" in preference to the term "toxic goiter" because of the confusion and disagreement relative to our present knowledge of structural as well as functional disturbances of the thyroid gland and to the lack of a standard terminology. Relative to the etiology of goiter, it appears that merely the lack of sufficient iodine is not the only factor. This thought is strengthened by the universal observation that, in most instances, only one is afflicted, while other members of the same family with similar food, water, geologic and climatic environments remain free. This suggests a change or error in physiologic chemistry, preventing an absorption and chemical modification of iodine or other essential substances; or a sustained demand upon an individual thyroid gland in excess of the amount it can normally secrete.

In considering the subject of goiter, three problems immediately present themselves, viz: (1) the structure of a normal as well as a goitrous thyroid; (2) the function of a normal and goitrous thyroid; and (3) the resistance or reaction of the organism to the goitrous products. Temporary functional or compensatory enlargements of the thyroid should not be considered under the term "goiter."

#### THYROID STRUCTURE

The thyroid differs from all other glands of internal and external secretion in that it contains four different types of normal parenchyma, maintaining a portion of its embryonic structure in decreasing proportions throughout the life of the organism. The various internal and external, normal and abnormal environments of the organism, including age, geologic and climatic changes, may have an effect upon the structure and function of the gland. In considering the structure of an abnormal thyroid or goiter, the structure of the normal gland should first be taken under consideration. The four different types of normal parenchyma may represent a succession of events in thyroid metaplasia. In genealogic order of structure, we have (1) the *interfollicular* or embryonic cell, which decreases in proportion as the organism grows older; (2) the fetal follicle, formed from the *interfollicular* embryonic cells, which decreases in proportion as the organism grows older; (3) the mature follicle, formed quite likely from the fetal follicle, which increases in proportion as the organism grows older; and (4) the colloid follicle which is a resting or inactive unit, having the same life history as the mature follicle. It probably originated from the mature and even from the fetal follicle.

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* Read before the Annual Meeting of American Association for the Study of Goiter, Seattle, Wash., July 10-12, 1930.

It cannot be disputed at present that the amount and type of structure of the normal thyroid determines the amount and type of secretion produced. Quite likely the fetal follicles do not secrete in the fetus. Do they secrete later when the fetus changes from a parasitic to a nonparasitic organism? In what manner do the fetal follicles of toxic adenomata secrete? The function, and perhaps the structure, of the thyroid quite likely differs during the various epochs of vertebrate life, viz: fetality, childhood, puberty, adolescence, maturity, menstruation, pregnancy, lactation, menopause, senility, abnormal remote physiologic chemistry, abnormal remote endocrinism, toxemia, physical and mental activity and fatigue. With so many factors influencing the thyroid, a gland of four types of normal parenchyma, and each quite likely having different degrees of susceptibility and response to stimuli, a standardized classification of normal and abnormal structure, as well as function, seems most remote for the present.

In considering the structure of hyperfunctioning or toxic goiters, over which there remains no little dispute as to a clinical classification, two definite types of parenchymatous changes are always found, viz: (1) parenchymatous hyperplasia, and (2) parenchymatous hypertrophy. Parenchymatous hyperplasia is represented by: (a) an increase in numbers of *interfollicular* or embryonic cells which produce no secretion; (b) an increase in numbers of the *intrafollicular* secretory cells; and (c) an increase in numbers of fetal follicles, encapsulated or nonencapsulated. It is not known if mature and colloid follicles ever increase in numbers. Parenchymatous hypertrophy is represented by an increase in size of cells and of follicles. So far as is known at present, the only cell which increases in size is the intrafollicular secretory. Relative to an increase in the size of the follicles, we have the enlarged follicles seen in exophthalmic and colloid goiters. The development of a fetal to a mature folicle is probably of negative significance in the structure of goitrous thyroids. An overdeposit of colloid and a prolonged hyperplasia and hypertrophy of intrafollicular secretory cells result in a compensatory hyperplasia of reserve thyroid structure, viz: the fetal follicle and the interstitial embryonic cell.

If the terms "parenchymatous hypertrophy" and "parenchymatous hyperplasia" are to endure, they should designate to which type of parenchyma of the thyroid they are applied; the difference between hypertrophy and hyperplasia should also be better understood and more correctly used. All toxic goiters are quite likely accompanied by an enlargement of the thyroid from 1 to 1000 per cent or more, due primarily to a hyperplasia and hypertrophy of a varying amount of *intrafollicular* secretory cells and of fetal follicles, and due secondarily to a hyperplasia of *interfollicular* cells and to an abnormal deposit of colloid. An increase in numbers of *interfollicular* cells and even of nonencapsulated fetal follicles may be a compensatory reaction; and the deposit of colloid, a modifying factor. An overdeposit of colloid in our part of the country is often followed by a compensatory hyperplasia of fetal follicles and of *interfollicular* or embryonic cells. Colloid goiters are rarely seen without an increase in numbers of fetal follicles, encapsulated or nonencapsulated. The encapsulation of large amounts of fetal follicles is more likely to be accompanied in time by hyperthyroidism from the fetal follicle.

### THE FUNCTION OF A NORMAL AND GOITROUS THYROID

The results of the functioning of a normal and abnormal gland depend directly upon two factors: (1) the amount and type of secretion produced, and (2) the reaction of the organism to the thyroid products. The normal gland has four phases of activity: (1) the fetal; (2) the development of remote structures and the maintenance of specific chemistry from infantile to mature life; (3) the maintenance of structure and specific chemistry during mature life, including the support of the fetus in the female; and (4) a decreasing function in senility. The various epochs of life with their varying stimuli and demands must call upon thyroid function in significant amounts, later calling upon reserve function which may, in turn, bring about primary followed by secondary metaplasia, hyperplasia and hypertrophy of any or all of the parenchymatous structures of the gland. A knowledge of the factors producing hyperplasia and hypertrophy of each parenchymatous structure would help greatly to solve the goiter problem. S. Burt Wolbach and Harvey Cushing, at the Peter Bent Brigham Hospital, found a marked hyperplasia of *intrafollicular* secretory cells in cases of hyperpituitarism of the anterior lobe (personal communication). We recently operated upon a woman for *intrafollicular* secretory cell hyperplasia and hypertrophy (exophthalmic goiter) who was an advanced acromegalic. It appears evident that *intrafollicular* secretory cell hyperplasia may occur without exophthalmos, but exophthalmos rarely if ever is found without this type of parenchymatous change somewhere in the gland. When a decreasing activity of life occurs, we know that the organism may spare more of its thyroid function, a significant factor in thyroid surgery.

The thyroid, in one of its roles, apparently maintains the upper 40 per cent of metabolism. When the mechanism, which maintains the lower 60 per cent fails, is there a possibility of that failure stimulating the gland to an increase in function which, if maintained, brings about an increased structure? Many individuals have a thyroid which cannot maintain the upper 40 per cent of metabolism and other essential activities, while others must contend with an overactive gland, an overabundance of normal structure or a lack of a balancing mechanism which holds the catalystic and other activities of the thyroid secretion within normal bounds. The various ages, epochs, abnormalities, varying amounts and multiplicity of normal thyroid parenchyma, and the inconstant balancing mechanisms for endocrinisms as a whole, with geologic and climatic influences, indicate that we must give the gland a constant changing consideration and that we shall, perhaps, never know the normal and abnormal percentage of parenchymatous structure in normal and goitrous thyroids.

### THE RESISTANCE OR REACTION OF THE ORGANISM TO GOITROUS PRODUCTS

The resistance or reaction of the organism to the goitrous products seems inconstant. The size of the thyroid does not necessarily indicate the amount of secretion. Is the active parenchyma represented by the mature follicle only? Why does the fetal follicle seem so active in toxic adenomata? Small doses of thyroxin or thyroid extract are very stimulating to some individuals, while others may take 100 grains or more of the same desiccated extract and show no response. Absorption from the alimentary tract and liver action may have some bearing in such instances. Can a thyroid gland constantly hypersecrete without parenchymatous changes? Is hyperplasia limited to fetal follicles and to the cells lining all three types of follicles—fetal, mature and colloid? Must a thyroid always be enlarged to be toxic? Does a toxic goiter always mean hyperthyroidism? Are there different forms of hyperthyroidism or thyrotoxicosis? Is a toxic goiter or hyperthyroidism always accompanied by hypermetabolism? The resistance of the organism to hypersecretion of any product from the thyroid determines the direct status of that individual towards any type of constant hyperthyroidism.

### THYROIDISM

The results of the activities of any thyroid gland may be considered under the term "thyroidism," of which we have two types: (1) normal and (2) abnormal. Under both forms of thyroidism the various ages and epochs, together with the various internal and external environments of the individual, must be given due consideration as modifying factors.

### ABNORMAL THYROIDISM

Abnormal thyroidism occurs in three forms: (1) a complete or incomplete decrease in normal products; (2) a complete or incomplete increase in normal products; and (3) a complete or incomplete increase in abnormal products. It seems logical to assume that any gland may secrete an abnormal product. Overfeeding of desiccated thyroid products produces hyperthyroidism without exophthalmos. If we could feed specific normal or abnormal parenchymatous tissue alone, more information might be obtained. The production of the syndrome of exophthalmic goiter has never been produced artificially in man, one fact which made Plummer feel that it represented a secretion of an abnormal product which he modified by the administration of iodine. An increase in the secretion of normal and abnormal products results in numerous phenomena which we have been accustomed to consider as goitrous toxicity and for which we may use the term "toxic thyroidism."

### TOXIC THYROIDISM

Toxic thyroidism occurs with or without an apparent and palpable increase in the size of the thyroid gland. Since we do not know the normal size of any individual's gland, a moderate though definite increase can not always be determined. It is not known, therefore, whether or not any form of toxic thyroidism is ever unaccompanied by a hyperplasia of fetal follicles and a hyperplasia and hypertrophy of *intrafollicular* secretory cells. From accurate estimations of the average basal metabolic rates of many normal individuals, it is known that a minus 12 and a plus 12 are within the normal range and that such readings carry little clinical significance. It must be kept in mind, however, that in the former individual with an average normal basal metabolic rate of minus 12, a later accurate average basal rate of plus 12 indicates an increase of 24 and, if maintained, signifies hyperthyroidism in the absence of other influencing factors.

Toxic thyroidism is generally looked upon as accompanied by an increase in the amount of the secretory parenchyma and in the secretion of the thyroid gland. An increase above normal in a deposit of colloid or in a large number of interstitial or embryonic cells has no direct bearing upon the secretory or toxic properties of any goiter. Iodine increases the colloid deposit in exophthalmic goiters, but has the presence of colloid a direct bearing upon lessening the toxicity of the gland? Colloid is practically absent in both types of toxic follicles, the hyperplastic fetal and the more mature follicle with hyperplasia and hypertrophy of its secretory cells.

The terms "primary and secondary toxic goiters" are useful in that a so-called exophthalmic goiter may originate in a normal gland and is then a primary exophthalmic, or it may originate in a colloid or colloid adenomatous gland and is then a secondary exophthalmic. A standardization of terminology is feasible and easily attained but is far from a universal application. The exophthalmic goiter may be called an *intrafollicular* secretory cell hyperplasia; the adenomatous, a fetal follicle hyperplasia; and there may also be a mixture of both.

In all instances, toxic thyroidism occurs: (1) when the *intrafollicular* secretory cells of a normal gland's mature and colloid follicles increase in numbers and size—follicular cell hyperplasia and hypertrophy—producing what is termed "an exophthalmic goiter"; and (2) when fetal follicles increase in numbers — encapsulated fetal follicle hyperplasia—producing what is termed "an adenomatous goiter." The small fetal follicle is always present in great numbers in all goiters and may be deceptive in the microscopic diagnosis. They cause more confusion in structural classification than all of the other parenchyma, particularly in exophthalmic goiter when they are found in greatly increased numbers and rarely encapsulated. Wilson and Goetsch have designated this as adenomatosis which, I think, may be a compensatory response in the presence of an exhaustive hyperplasia of cells lining follicles. Interstitial or embryonic cells and fetal follicles, from which other follicles arise, decrease in proportion as the normal gland increases in age (fig. 1). If demands upon the gland occur before senility, a compensatory hyperplasia occurs which is normal and most confusing to a microscopic study limited to one section.

Toxic thyroidism is considered as being accompanied by an enlargement of the thyroid and an increase in metabolism. We see many individuals, who have one or more fetal adenomata with an average basal metabolic rate of around normal, who gain in weight and lose their previous nervous and cardiac irritability by removal of the adenomata. Their metabolic rates, under usual activity and nourishment, must be well above the normal active rate. Such cases represent adenomatous goiters with an average normal basal metabolic rate, which hypersecrete to a degree of toxicity under activity and regular nourishment. We, therefore, must recognize two types of adenomatous goitrous toxemia: one with an increase in *basal* metabolism, and one without.

Practically all individuals with exophthalmos and hyperplasia of the cells lining all three types of follicles, which we term "exophthalmic goiter," have a marked increase in basal metabolism. In fact, basal metabolic readings, when increased, are generally assumed to be due to hyperthyroidism. It is fully as illogical to assume that there is only one form of thyroid secretion as to assume that there are more. Does a toxic goiter always mean hypermetabolism and hyperthyroidism? When a hypersecretion of all thyroid products occurs, quite likely hypermetabolism occurs. When a hypersecretion of a portion of thyroid products occurs, hypermetabolism may not occur. This brings us to the title of our paper "A Third Type of Toxic Thyroidism." From our gross and microscopic studies of all the goiters we have removed, the number of which approaches 2,000, and from the studies of many others, we have reached an unbiased interpretation which agrees with that of H. S. Plummer who feels that we have more than one type of toxic thyroidism which, when occurring in pure forms, emanates from two types of thyroid parenchyma, e.g., (1) hyperfunctioning or toxic fetal adenomata or fetal follicle hyperplasia; and (2) a toxic secretion from hyperplastic and hypertrophic secretory cells lining any type of follicle, known as exophthalmic goiter. Both of these types are usually accompanied by hypermetabolism and other symptoms and signs of a systemic irritation. In pure forms they are entirely different clinical syndromes. Old hyperfunctioning toxic adenomatous goiters often develop the syndrome of exophthalmic goiters, due to an additional change in the *intrafollicular* secretory cell which did not exist before.

We have a series of cases to report which, we feel, represents a distinct form of toxic thyroidism and which is closely related to the type known as exophthalmic goiter. It is represented by exophthalmos, with or without an increase in the size of the thyroid gland, with average basal metabolic readings around or below the normal point and ac-

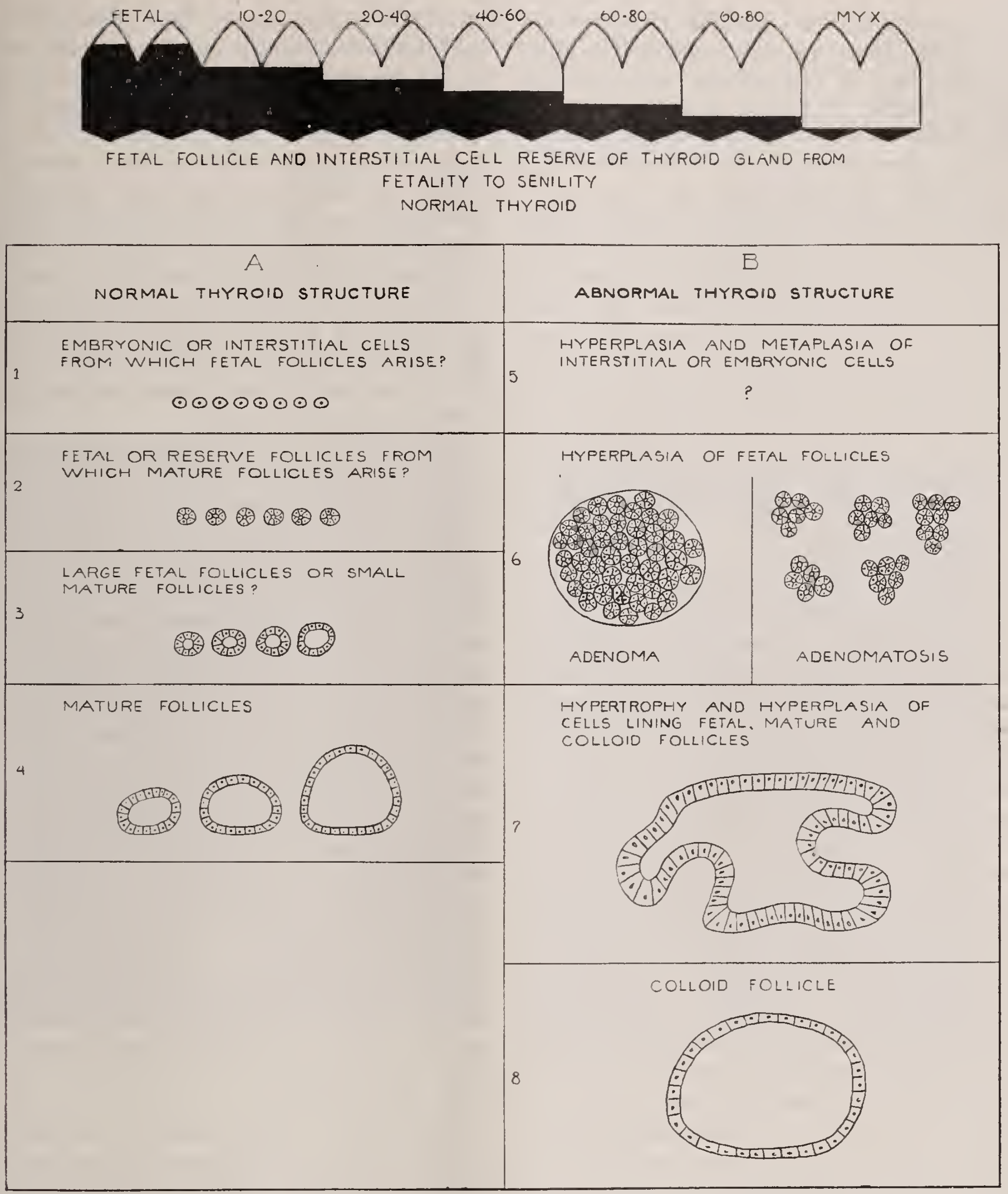
FETAL
10-20
20-40
40-60
60-80
60-80
MYX
FETAL FOLLICLE AND INTERSTITIAL CELL RESERVE OF THYROID GLAND FROM FETALITY TO SENILITY
NORMAL THYROID
A
NORMAL THYROID STRUCTURE
B
ABNORMAL THYROID STRUCTURE
1
EMBRYONIC OR INTERSTITIAL CELLS FROM WHICH FETAL FOLLICLES ARISE?
5
HYPERPLASIA AND METAPLASIA OF INTERSTITIAL OR EMBRYONIC CELLS
?
2
FETAL OR RESERVE FOLLICLES FROM WHICH MATURE FOLLICLES ARISE?
HYPERPLASIA OF FETAL FOLLICLES
6
ADENOMA
ADENOMATOSIS
3
LARGE FETAL FOLLICLES OR SMALL MATURE FOLLICLES?
4
MATURE FOLLICLES
7
HYPERTROPHY AND HYPERPLASIA OF CELLS LINING FETAL, MATURE AND COLLOID FOLLICLES
8
COLLOID FOLLICLE

Fig. 1. Shaded area represents roughly, in the normal thyroid, the percentage of interstitial or embryonic cells and fetal follicles from fetal life to senility. Note the steady decrease as age increases. In goitrous thyroids, this change is less marked, indicating a hyperplastic compensating reserve of basic thyroid parenchymatous structure, which may result in fetal adenomata or more advanced metaplasia to enlarged follicles, the secretory cells of which may become hyperplastic and hypertrophic. Under column A, the normal structure is illustrated, all of which is found in a varying proportion throughout life. If any one of the structures greatly increases in volume, an enlarged thyroid or goiter results. Only two types of hyperplasia result in toxic thyroidism, i.e., 6 and 7. Number 6 results in hyperplastic fetal follicular toxic thyroidism, and number 7 results in intrafollicular secretory cell toxic thyroidism. Hyperplasia of numbers 5 and 7 merely enlarge the gland.

companied by a hyperplasia and hypertrophy of the secretory cells lining the follicles. The microscopic picture of the gland resembles that of exophthalmic goiter. Its course is not influenced by the administration of iodine, and the exophthalmos increases or remains stationary. The administration of minute doses of thyroid extract increases the exophthalmos and produces marked stimulation and an increase in the basal metabolic rate.

This type of toxic thyroidism occurs previous to any surgical interference with the thyroid and also after 80 to 90 per cent of an exophthalmic goiter of a pure type has been resected, with a resulting basal metabolic rate of close to or far below normal. When following surgical resections, it has, in my experience, been associated primarily with a pure or primary exophthalmic goiter. By a pure or primary exophthalmic goiter, we mean a hyperplastic and hypertrophic change of *intrafollicular* cells occurring in a normal thyroid gland. This type of thyroidism does not display in the patient the stimulation seen in the normal toxic goiter case. The patient is noticeably calm and even depressed. The loss of weight is negative and the heart rate is practically normal. They come to the physician complaining of an exophthalmos and weakness. The late Harold Gifford, who referred two of these cases to us, termed the condition "pseudo-Graves' disease."

Israel Bram (*Endocrinology,* vol. 13, pp. 164-180, 1929) in a series of 4000 goiters found that .5 per cent occurred with low metabolic rates. It would be interesting to know the type and size of the thyroid, the degree of exophthalmos and the final results in each of these cases. Margaret M. Kunde (*American Journal of Physiology,* vol. 82, pp. 195-215, 1927) reports the production of exophthalmos in rabbits, whose thyroids were removed and in a condition of myxedema, by the administration of thyroid extract. In the human no examples of exophthalmos have been produced by the administration of thyroid extract to myxedematous patients. Leo M. Zimmerman (*American Journal of the Medical Sciences,* July 1929) reports eight cases of hyperthyroidism, in which the exophthalmos became more marked after the process had been modified by a partial thyroidectomy and the basal metabolic rate had been brought to normal. His series appears similar to our postoperative cases. We have been unable to find a report of cases similar to those we are now reporting which have not been operated upon.

The only treatment we know of is as complete removal of the thyroid as possible without injuring adjacent important structures. This is based upon the thought that, if iodine or thyroid extract does not alleviate the exophthalmic condition, which has been the result in this series of cases, the patient is benefited by a complete removal of the offending tissue and the administration of normal thyroid extract.

## CONCLUSIONS

The thyroid gland in a normal structural and functional state contains four types of parenchyma which normally change in proportion to the individual's age and to internal and external environmental stimuli. All types of goiters are due to a hyperplasia of one or all of the different parenchyma. Those goiters which secrete a substance sufficient to produce an increase in metabolism and other toxic manifestations bring about this condition by one or two structural changes, viz: (1) a hyperplasia of fetal follicles represented by encapsulated or nonencapsulated adenomata, and (2) a hyperplasia and hypertrophy of cells lining fetal, mature and colloid follicles, which generally produce in time the well-known clinical picture designated as exophthalmic goiter.

In many instances, hyperplasia of fetal follicles produces sufficient secretion to bring about a cardiovascular and nerve tissue irritability without an increase in basal metabolic rates. Removal of these adenomata restores the patient to satisfactory health. The complete lack of a change in structure of fetal follicles from the normal, when they are hypersecreting in a toxic adenoma, is confusing but characteristic. Another puzzling condition with fetal adenomata is the relief of hyperthyroidism when these adenomata are removed after they are more or less completely degenerated and structurally present an appearance of lost function. In practically all instances, hyperplasia and hypertrophy of the secretory cells lining follicles produce the clinical picture of exophthalmic goiter, with a varying degree of enlargement of the thyroid and of exophthalmos. To date, no one has ever reported a thoroughly studied case of exophthalmos, with toxic thyroidism and hypermetabolism, without the presence of hyperplasia and hypertrophy of the cells lining many of the follicles. From a structural viewpoint, a hyperplasia of fetal follicles is an entirely different affair.

There is here reported a group of cases with or without a palpably enlarged thyroid, with a normal or subnormal basal metabolic rate, with progressive exophthalmos, with no cardiovascular or nerve tissue irritation, with the thyroid glands showing a hyperplasia and hypertrophy of cells lining the follicles and with no modification by the administration of iodine but with a marked susceptibility to desiccated thyroid extract, particularly the exophthalmos. In other words, we have a clinical condition represented only by a progressive exophthalmos, and a hyperplasia and hypertrophy of follicular cells occurring before a surgical resection or after an extensive resection with very little functioning thyroid tissue remaining. Most of these cases demonstrated a paralysis of the superior rectus muscle by inability to elevate the eyeball. As the exophthalmos increased, the inability to elevate the eye increased.

### CASE REPORTS

Case 1. J. P. F., University Hospital 31949, male, age 39. For past two years, increasing unilateral left exophthalmos. One year after onset, left orbit explored by ophthalmic surgeon for tumor, owing to marked and progressive unilateral exophthalmos with no other symptoms or signs of any other disease and no loss of weight or strength. Six months after operation, right-sided exophthalmos began and after another six months he presented left exophthalmos * * * and right * * * and B M R minus 2. About twenty-four months after onset of left and six months after onset of right exaphthalmos, first signs of hyperthyroidism began with increased appetite, tachycardia only on exertion, loss of weight of ten pounds and slight nervous irritability. The pulse rate averaged 78, and the blood pressure averaged 132/72. The average basal metabolic rate was plus 15, and the thyroid gland was hard but palpably not enlarged. Lugol's solution, 10 drops t.i.d., in one month produced an average basal metabolic rate of minus 12 which remained thereabouts for the following year with a continuous ingestion of 10 drops t.i.d. During the last year, the exophthalmos gradually increased with a resulting left conjunctivitis owing to the exposed eyeball which could, at no time, be covered by the eyelid (fig. 2). In May, 1930, I removed practically all of the thyroid gland, leaving only enough to protect the parathyroids and the recurrent laryngeal nerves. The radical resection of the gland was advised with the thought of removing all of the tissue producing the progressive exophthalmos. The microscopic sections revealed hyperplasia of the *intrafollicular* cells, involving most of the mature-size follicles.

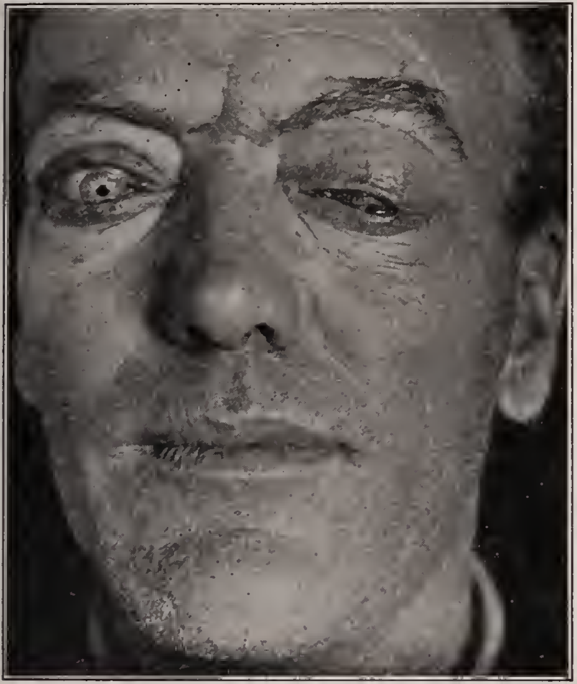

Fig. 2, Case 1, Univ. Hosp. 31949. Preoperative exophthalmos. Right, grade 1+ and left, grade 3+. Left orbit explored by experienced ophthalmic surgeon for intraorbital tumor. Basal metabolic rate at this time was minus 12; pulse rate of 72; thyroid gland barely palpable and very hard. Exophthalmos increased for one year; when reexamined, found a basal metabolic rate of plus 17; a markedly enlarged thyroid, grade 2; pulse rate of 100; and right exophthalmos, grade 2+; left, grade 4 with advanced conjunctivitis. Bilateral resection performed May 30, 1930.

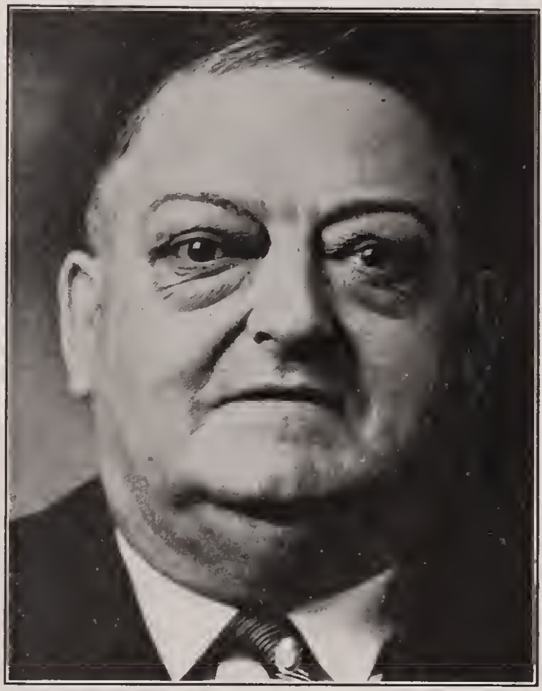

Fig. 3, Case 2, G-4716. Postoperative exophthalmos. Note the puffy eyelids but no exophthalmos. Photograph taken before operation. Typical case of exophthalmic goiter sans goiter.

Case 2. L. Y., G-4716, male, age 57. This patient, a traveling salesman, complained of weakness and tachycardia for the past year, during which time he had dropped in weight from 250 to 200 pounds. He had not noticed any other symptoms until two months before examination, when a marked coarse tremor developed. He had taken 10 drops of Lugol's solution t.i.d. for two months without benefit. His physical inspection revealed a man greatly overweight after having lost fifty pounds, with a pulse rate of 98, blood pressure 142/84 and a hard thyroid gland barely palpable. There was no exophthalmos, stare or lagging lids. Both upper and lower lids were puffy. Two basal metabolic rates averaged plus 17. A bilateral resection of a hard gland about one and one-half times the normal size was performed, leaving about one-tenth the amount of a normal gland. He immediately improved to normal from all previous complaints, excepting his strength which he has never fully regained. Nine months later, he returned to us complaining of weakness and an increasing exophthalmos which he first noticed three months after the operation, when he consulted Dr. Ralph Richards of Salt Lake City who found his basal metabolic rate below normal. Our findings, nine months after the operation, were: a basal metabolic rate of minus 14, a drop of 31 from the reading just previous to his operation; a right exophthalmos of grade 2 plus and left of grade 1. The right superior rectus muscle was almost completely paralyzed, and the only manner in which he could elevate his eye was to throw his head backward and contract his orbicularis muscle. He was given thyroid extract and Lugol's solution with practically no improvement. In this patient, the exophthalmos came on after the hyperthyroidism disappeared and during a minus 14 metabolic rate (figs. 3 and 4).

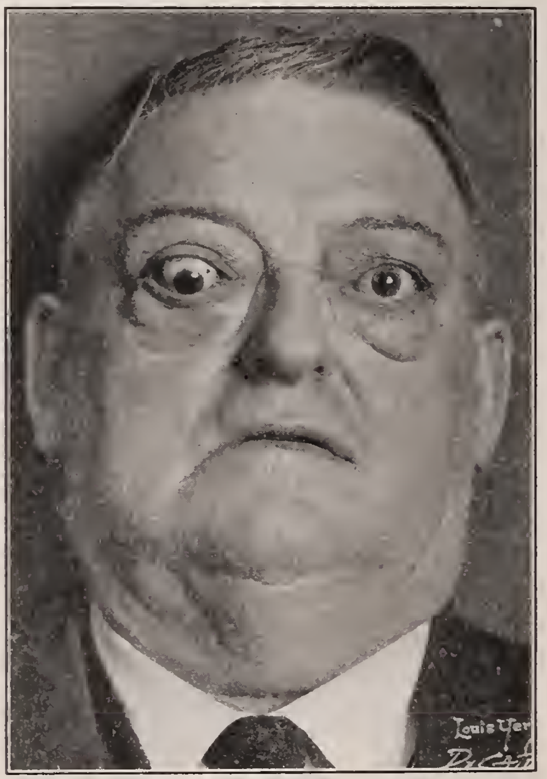

Fig. 4, Case 2. G-4716. Postoperative exophthalmos. Note same puffiness of eyelids and marked exophthalmos. Right eye grade 3 plus; left eye grade 2. Note paralysis superior rectus of right eye. Photograph taken one year after operation with basal metabolic rate of plus 1 and with normal weight, but with marked weakness, general muscular asthenia; all symptoms and signs developing soon after the operation. Pulse rate, 70 to 80. Lugol's solution taken constantly.

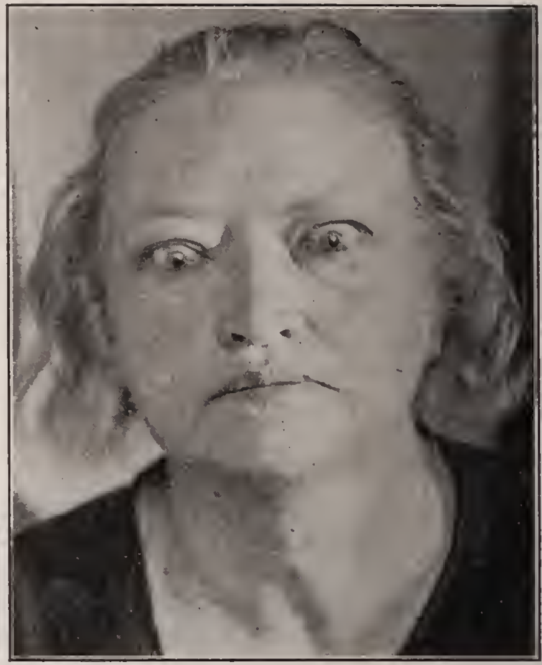

Fig. 5, Case 3, G-4086. Postoperative exophthalmos. Previous to operation basal metabolic rate was plus 33; enlarged thyroid grade 2; pulse 132; and no exophthalmos. Six months later, basal metabolic rate was minus 21; no palpable thyroid tissue; pulse 72; and marked exophthalmos grade 3. Bilateral paralysis of superior recti muscles.

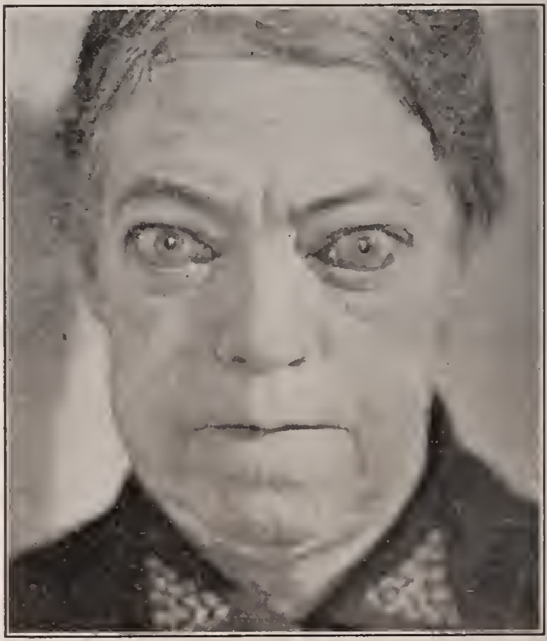

Fig. 6, Case 4, G-5044. Postoperative increase in exophthalmos. Previous to operation, bilateral exophthalmos grade 1. Six months later, grade 3. Basal metabolic rate previous to operation was plus 33. Six months later, basal metabolic rate was minus 16 and no thyroid tissue palpable. Lugol's solution taken constantly.

Case 3. M. B., G-4086, female, age 46. This patient was a farmer's wife, married 29 years with seven children. About four years before our consultation, she was sick for one year with exhaustion. Since then, the patient has never fully recovered in strength. Three and one-half years after the above spell of exhaustion had receded, she first noticed a goiter which enlarged steadily for six months, during which time under her family physician's care she lost thirty-two pounds and continued losing. During her examination she remained listless, in marked contrast to the typical exophthalmic goiter case. Her pulse rate varied from 100 to 122, and the blood pressure was 138/75. The thyroid was firm and felt about two and one-half times the normal size with no bruits or thrills. There was no exophthalmos, stare or lagging lids. An average basal metabolic rate of plus 32 was found after twelve hours of rest with no food. A bilateral resection was done with a rapid gain in weight and strength to normal, with a pulse rate of 80 and a basal metabolism rate of minus 5 three weeks after the operation. Six months later, the patient returned with a bilateral exophthalmos, grade 2, and an inability to raise the eyeballs. She had lost strength which, however, was partly at least from worry. Her average basal metabolic rate was minus 21. This patient was difficult to control, and she was given thyroid extract alone elsewhere, which brought on symptoms of an exophthalmic

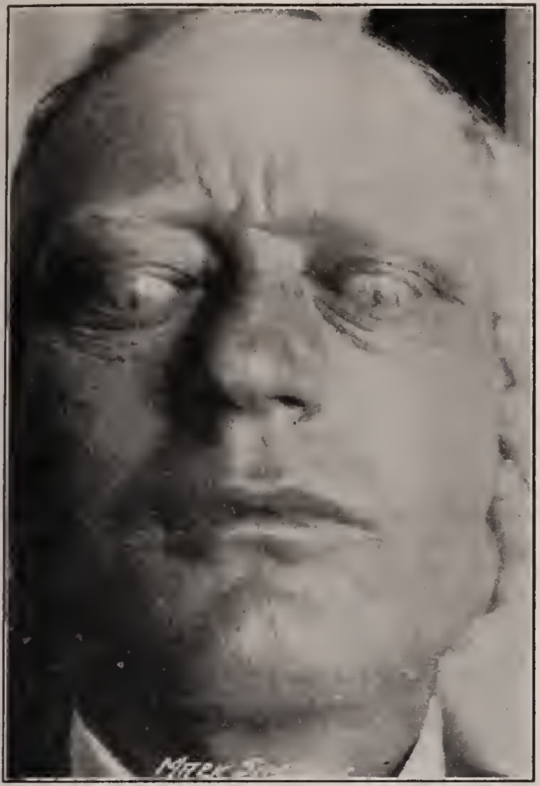

Fig. 7. Case 5, G4283. Preoperative exophthalmos. Progressive exophthalmos with paralysis of superior recti muscles. Basal metabolic rate of minus 14, slow hypometabolic activity; pulse of 78. No goiter, thyroid barely palpable and very hard. Operation refused.

goiter which brought her back to us again, when we found her basal rate to be plus 25. There could not be palpated any thyroid tissue and during this spell of hyperthyroidism, under thyroid extract, she became more normal and felt better in general, excepting for her eyes. She has consulted numerous physicians since with no improvement in her eyes. In this patient, the exophthalmos came on after hyperthyroidism disappeared and during a minus 21 basal metabolic rate (fig. 5).

Case 4. L. M., G-5044, female, age 54. This patient had never married and was referred to me by Dr. W. J. Davies of Fremont, Nebraska. She was always well until two and one-half years before October 10, 1928, when she first noticed bilateral exophthalmos soon followed by an enlarged and noticeable thyroid, nervousness, tremor, loss of weight and strength and edema of the ankles. Upon examination, there was found an exophthalmic goiter with bruits and thrills, about four times normal in size and firm in consistency; a pulse rate of 124, a basal metabolic rate of plus 33, and blood pressure 160/80. The bilateral exophthalmos was considered minus 1. Two weeks later, a bilateral resection was performed with a rapid return to normal health and a basal metabolic rate of minus 5. Two months after the operation, the patient returned complaining of an increasing bilateral exophthalmos and conjunctivitis, due to the lids not covering the eyeballs while winking and sleeping. The exophthalmos was then about 3 plus, the conjunctivae markedly congested, and an inability to elevate the eyeballs was noticed. The pulse rate averaged 70, the blood pressure was 122/82, and the basal metabolic rate averaged minus 16. She had gained 30

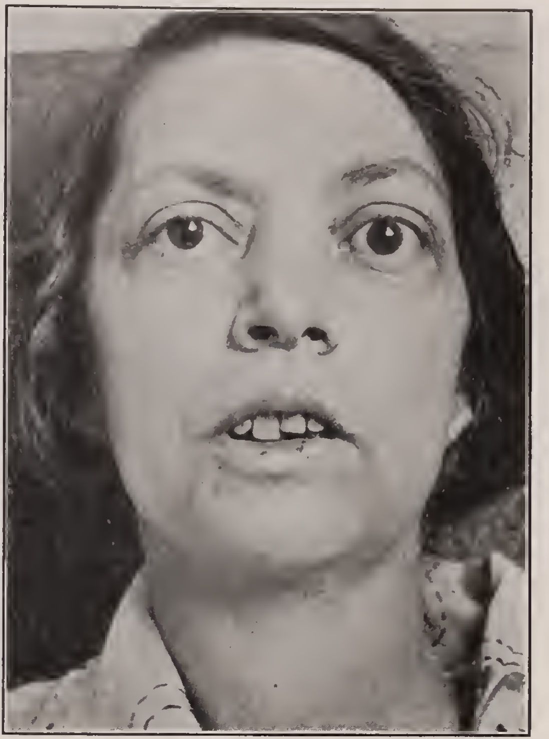

Fig. 8, Case 6, G-5507. Preoperative exophthalmos; basal metabolic rate, minus 16; pulse 80; and thyroid hard but barely palpable. Exophthalmos bilateral, grade 1 plus. Administration of 1 grain of thyroid extract daily for 10 days increased the basal metabolic rate to plus 8 with a pulse of 140 and exophthalmos greatly increased. Six months after operation, a complete cure.

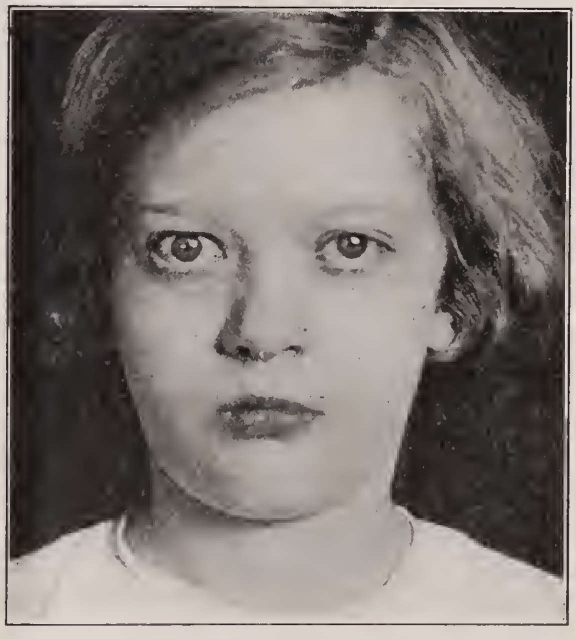

Fig. 9, Case 7, G 5898. Patient, age 10. Complaint, unilateral exophthalmos and irritability for four weeks past. For one year previous, suspicions of pulmonary tuberculosis. No signs of stimulation or hypermetabolism but skin warm and moist. All other physical and laboratory tests negative. Surgery not advised and Lugol's administered with negative results. One year later, condition the same.

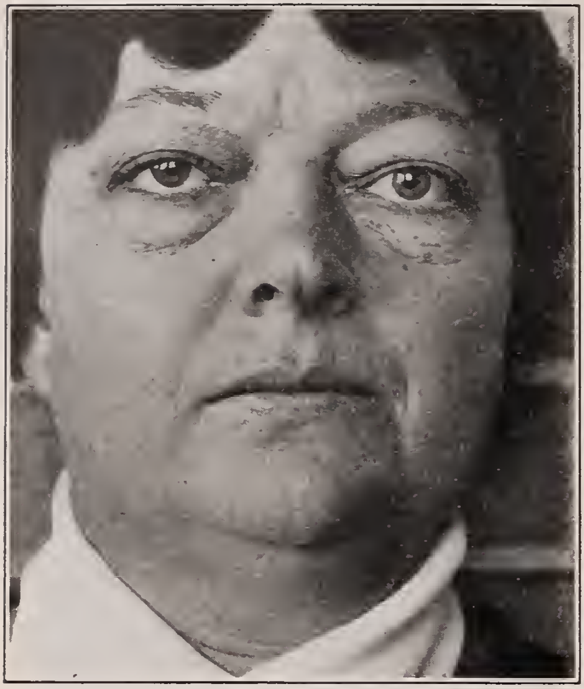

Fig. 10, Case 8. G 2105. Preoperative bilateral exophthalmos grade 1+; marked puffiness of eyelids. Basal metabolic rate plus 2; pulse 76; thyroid gland barely palpable only because of extreme hardness and estimated to be normal in size. Bilateral resection performed, leaving about one-tenth the size of a normal gland. Photograph taken one week after operation. Six months later, basal metabolic rate of minus 15; exophthalmos receded about 75 per cent and general feeling of good health with the exception of cold intolerance and mild aching of joints. Administration of thyroid extract, grains 3 per diem for two weeks, resulted in great increase in exophthalmos to grade 2–, pulse of 136 and basal metabolic rate of plus 22. One month after cessation of thyroid extract, the exophthalmos almost disappeared and pulse returned to 82. A third basal metabolic rate was not taken but easily estimated over 20.

pounds and felt perfectly well, excepting for the exophthalmos. Lugol's solution was prescribed, and one year later the eyes were about the same (fig. 6).

Case 5. M. S., G-4283, male, age 47. This patient was an eastern Nebraska farmer and was referred to me by the late Harold Gifford as a case of "pseudo-Graves' disease." He had been perfectly well until four months before June 14, 1927. At that time the patient had the "flu," during which he had a tremor, palpitation, occipital headaches and nervousness and a loss of ten pounds without gastrointestinal abnormalities. One month after attack of "flu," which debilitated him three weeks, his eyes began to protrude with a constant feeling of irritation as though a foreign body were within. The progressive exophthalmos brought him to Dr. Harold Gifford. The superior recti muscles were "paralyzed" as the patient was unable to elevate the eyeballs. The usual laboratory data were negative, including a Wassermann. The basal metabolic rate was minus 14, the blood pressure was 128/64, and the pulse rate was 82. The thyroid was barely palpable but firm in consistency, and there were no bruits or thrills. The exophthalmos was graded 2 plus and the eyes had the typical stare. The upper eyelids lagged a trifle, and both lids were puffy. There was a very slight fine tremor of the fingers. The patient acted "hypometabolically," sluggishly and indifferent, in marked contrast to the usual activities of an exophthalmic goiter case. He refused surgery and has not replied to inquiries. He was advised to take iodine to reduce the interfollicular cell hyperplasia and also thyroid extract to increase the basal metabolic rate (fig. 7).

Case 6., G. W., G-5507, female. This patient, a married woman with three children, came to the hospital complaining of weakness and palpitation of two years' duration, and severe headaches, spells of vomiting and a loss of ten pounds in weight for seven weeks. For the past three months, she noticed a progressive exophthalmos with diplopia. At no time had she noticed a goiter. Her pulse rate, 80; blood pressure, 100/92, and her average basal metabolic rate was minus 17. Both eyes were equal with an exophthalmos grade 1 plus. The thyroid was barely palpable with a noticeable isthmus. One-grain doses of thyroid extract, within eight days' time, increased her pulse rate from 80 to 120, the exophthalmos to grade 2 and her basal metabolic rate to plus 8. Owing to her gastrointestinal complaint and bilateral exophthalmos, in spite of her minus 17 basal metabolic rate previous to stimulation by thyroid extract, a bilateral resection of her thyroid was performed with a disappearance of the gastrointestinal symptoms and a deep severe headache. There is a greater degree of exophthalmos nine months later (fig. 8).

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# THE CLASSIFICATION OF GOITER *

S. D. Van Meter, M.D.
DENVER, COLO.

It has always been hard to understand why so many members of the medical profession are poorly informed about the few established facts concerning goiter. This certainly cannot be the result of lack of interest in a problem so vital to the health and future of our race. We think it is due to bewilderment caused by present complicated and unsatisfactory classifications of goiter. This is unfortunate, since in studying any disease we must start with a lucid definition and classification of that disease.

The dictionary definitions are inaccurate since they do not define the entity known as goiter. Classifications in goiter literature confuse instead of enlighten the reader. In many instances authors have failed to realize the necessity of beginning with a clear statement of their conception of goiter. They have frequently disregarded the fact that goiter, although the most common, is but one of many diseases of the thyroid, and have included other diseases in their classifications. Many have made the mistake of selecting outstanding but inconstant characteristics, such as exophthalmos, to designate a type.

Attempts at classification on a histopathologic basis are to be commended. They are sure to fail,

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* Read before the Annual Meeting of American Association for the Study of Goiter, Seattle, Wash., July 10-12, 1930.

however, as long as histopathologists hold their present widely divergent views. This state of affairs will continue until the basic cause of goiter is known. The discovery of that cause will decide whether or not there is more than one primary type of goiter and make it possible to formulate a classification upon an etiologic basis, the only rational one.

In the meantime, however, we must have some classification in order to be understood when writing and speaking on the subject of goiter. Let us avoid the aspects of the problem on which opinions differ widely and found our classification on facts and established hypotheses.

No one disputes the fact that man and many of the lower animals suffer from goiter; that its cause is intimately associated with drinking water, food and sanitation; or that its first stage is a disturbed function or physiology of the thyroid gland, especially that of iodine metabolism. Iodine is agreed to be an efficient preventive, but many contest the claim that goiter is caused solely by iodine deficiency. All agree that children of goitrous parents are susceptible to goiter, and that deafmutism, cretinism and other kindred conditions are often stigmata of the disease. When we try to move further we meet disagreement. For example, there is much to support the theory that there is more than one primary type of goiter. The most ardent partisan of the theory, however, does not pretend that he can prove it.

We should always be willing to listen to new opinions on an unsettled question. Even though confident of our solution, we should not expect it to be accepted until it is sustained by scientific proof. Until we have proof to the contrary, it is safer to consider goiter as a single disease of many phases. We would define goiter according to its definitely accepted characteristics as, *a disease of unknown cause, the most common characteristics of which are disturbed function and enlargement of the thyroid gland.*

With this definition of goiter as a foundation we shall classify the types of the disease met with in routine practice.

The most natural and practical division, on which there is no disagreement is that based upon physical characteristics. This principle gives us, first, the *symmetrical;* and, second, the *nodular.* Each of these classes may in turn be divided, first, into *nontoxic;* and, second, into *toxic,* according to resulting constitutional symptoms.

These divisions are difficult to make in borderline cases. The palpating hand may not be able to feel a deep or small nodulation. The cardinal signs of toxicity may be so slight that they are not recognized. These two general divisions, however, serve us well in classifying the common clinical types seen in every day practice.

As a rule symmetrical goiters represent an early stage, and nodular goiters a later stage of the disease which at the first was only a disturbed physiology of the thyroid. We find that the large majority of nontoxic symmetrical goiters occur in the first and second decades of life.

The most common variety of toxic symmetrical goiter is generally known as exophthalmic goiter, Parry's disease, Graves' disease or primary Basedow. We prefer to designate this variety as *toxic hyperplastic goiter,* since toxicity and hyperplasia are constant clinical and histopathologic characteristics, while exophthalmos occurs in less than fifty per cent of cases.

The majority of nontoxic nodular goiters occur in the third and fourth decades of life. Together they constitute that large class frequently called nontoxic adenomata. Since the tumors are not adenomata in the strict sense, we prefer to use the term *nontoxic nodular goiter.* This term should always be used with caution, since the activity or toxicity of goiter may be so well masked that it deceives the best clinician. The onset and progress of toxicity in the nontoxic nodular type are so insidious that we must be very careful before giving an opinion of nontoxicity.

Toxic nodular goiter is the most common type of toxic goiter in the middle and later decades of life. In all probability it occurs in three varieties. The first is probably due to perversion of secretion and to degenerative tissue changes in the nodules. In the second there is an associated histopathologic picture of the toxic hyperplastic variety. In the third the toxicity is the result of a combination of toxic hyperplasia and degenerative changes in the component tissue of the nodules.

To illustrate our conclusions we offer the following graphic representation of this simple classification, the same as has been agreed upon by the Committee on Classification and Nomenclature of this association.

GOITER

| *Symmetrical Goiter* | *Nodular Goiter* |
|---|---|
| 1. Nontoxic symmetrical | 3. Nontoxic nodular |
| 2. Toxic symmetrical | 4. Toxic nodular |

While we are ready to admit that this classification is not complete, we believe its simplicity alone commends it as practical until we are able to formulate a classification on etiology. Unfortunately this is impossible until the basic cause of goiter is known.

The common error of confounding outstanding symptoms, varieties and sequelae of goiter with types of the disease has been responsible for much of the confusion in goiter literature, and especially in the classification of goiter. For example, eminent authorities have even gone so far as to designate cretinism and myxedema as types of goiter. While these conditions are well recognized sequelae, they certainly are not types of goiter. The indiscriminate interchange of terms applied to symptoms, characteristics, sequelae and types must be discontinued before we can hope for any clarification of the present hodge-podge of classification.

No objection can be raised to the number of varieties of goiter one may choose to enumerate so long as the terms are descriptive of characteristics. Duplication of the same entity under different names is inexcusable. It should be discouraged.

To aid in making these points clear, the following tabulated resume of the most common varieties of goiter seen in the four types of our classification is presented.

THE MOST COMMON CLINICAL VARIETIES OF GOITER*

Type I

*Nontoxic Symmetrical Goiter*

a. Congenital goiter
b. Goiter of childhood
c. Goiter of adolescence
d. Goiter of pregnancy

(Varieties representing the large majority of inactive (?) colloid goiters of the early decades of life.)

Type II

*Toxic Symmetrical Goiter*

a. Toxic hyperplastic goiter (Exophthalmic goiter, Parry's disease, Graves' disease, or primary Basedow.)
b. Atypical varieties (Probably variations of a.)

Type III

*Nontoxic Nodular Goiter*

a. Nodular goiter without symptoms, other than hypofunction. (Frequently designated as nontoxic adenomatous goiter, fetal or adult.)

Type IV

*Toxic Nodular Goiter*

a. Nodular goiter with toxic symptoms, the result of perversion of secretion and degenerative changes of component tissue. (Frequently designated as toxic adenomatous goiter.)
b. Nodular goiter with toxic symptoms in which there is an associated histopathology of toxic hyperplastic goiter. (Secondary Basedow, adenomatous goiter with hyperthyroidism.)
c. Nodular goiter with toxic symptoms due to a combination of a and b. (Mixed type.)

Neoplasms of the thyroid, benign or malignant, inflammatory conditions and tumors the result of known infections and causes other than the goiter noxa, are not goiter.

The term malignant goiter should be applied only to malignancies which have developed in thyroid glands, where there is preexisting goiter. Such terms as congenital, adolescent, colloid, cystic, toxic, atheromatous, intrathoracic, malignant, substernal and exophthalmic should be used to designate varieties and not types of goiter. Unless this principle is observed, the almost endless special characteristics of the numerous phases of the disease would so greatly increase the number of types that simplicity in classification would be rendered utterly impossible.

The partisans of the theory that there is more than one primary type of goiter, and especially those who believe that the toxic hyperplastic variety is a disease distinct from endemic goiter, should consider other diseases which show manifestly different clinical syndromes, but which arise from a single cause.

It is a far cry from the clinical picture of the Hunterian lesion to that of paretic dementia, but not many years ago Noguchi proved that they were both caused by the *treponema pallidum.* Is it not possible that the classical syndrome of toxic hyperplastic goiter is due to the same basic cause as that responsible for other types of goiter, although there is no recognizable similarity in their histopathologic picture? May not the apparent difference in the syndrome of the acute form and that seen in long standing cases be due to the peculiar constitution of the patient, to his lack of resistance, or to unknown factors and not to a different primary etiology?

This simple classification formulated upon the undisputed characteristics of goiter is offered with confidence that its adoption would accomplish much in the simplification of the study of the disease. This desideratum cannot be expected of classifications formulated upon any basis, the essential features of which are not accepted as established facts.

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RECONSTRUCTION OF URETHRA AND PENIS FOLLOWING EXTENSIVE GANGRENE. In this case R. S. Mallard, Forth Worth, Texas (*Journal A. M. A.,* Aug. 2, 1930), used a skin flap from the abdomen because there was not enough skin left on the penis following a gangrenous process to be used as a flap. A free graft of full thickness of the skin from the thigh was first used unsuccessfully. The final result is not perfect, but the patient is able to have sexual intercourse in some satisfactory manner and to void through the newly constructed urethra.

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* Malignancy may occur in any of these types and should then be classified as malignant goiter of the particular type in which malignancy has developed. Deafmutism, cretinism and kindred conditions are sequelae and not types or varieties of goiter.

# THYROTOXICOSIS AND NEUROSIS

## THEIR DIFFERENTIAL DIAGNOSIS *

LINDON SEED, M.D.
CHICAGO, ILL.
Associate in Surgery, University of Illinois

For the purpose of determining criteria for the differential diagnosis of thyrotoxicosis and neurosis, thyrotoxicosis can be defined as a constitutional disease, the symptoms of which are alleviated within two weeks following a subtotal thyroidectomy. Such a dogmatic definition is academically incorrect but in the final analysis of the border line cases, after a careful consideration of all the data including the basal metabolic rates and the pathologic findings, the decision is most frequently made by answering the question, "Did the patient's symptoms disappear almost completely and immediately following a thyroidectomy?" Judgment in distinguishing between these two conditions is usually obtained by trial and error. A series of patients whose symptoms are not specifically characteristic are operated upon for thyrotoxicosis. Some promptly recover and thus justify the diagnosis; others do not improve or, if they do, the improvement is only temporary or occurs after months of continuous complaining and thus does not justify the diagnosis.

In a goitrous belt, of the patients who present themselves for examination complaining of a goiter or goiter trouble, only eighty-five per cent will actually have either a goiter or goiter trouble. Thirty per cent will have palpable goiters which have no relation to the symptoms presented. Of these two groups of patients, constituting about half the total number, some may have organic disease other than in the thyroid gland, but if the diagnostician is perfectly candid, his final diagnosis, after a thorough examination, in the vast majority of them is neurosis. This is a dangerous diagnosis, an admission that he does not know any organic cause for the symptoms. After having made this diagnosis he can offer no specific treatment but he can at least resist doing a thyroidectomy. At the present time, when a basal metabolic rate of plus twenty is so easy to obtain, when thyroidectomies are performed with greater safety and less provocation than formerly, neurosis might be defined as a symptom-complex which has no relation to the thyroid gland and is not relieved by a subtotal thyroidectomy.

The cardinal features of thyrotoxicosis are: (1) A loss of weight and strength, (2) tachycardia, (3) nervousness and tremor, (4) a goiter, (5) exophthalmos, (6) an elevated basal metabolic rate. After a consideration of these symptoms it would seem comparatively easy unerringly to arrive at the correct conclusion. It is unnecessary to call your attention to the fact that all of these signs and symptoms, except exophthalmos, may be present in neurocirculatory asthenia, disordered heart action, vagotonia, sympathetic imbalance, nervous exhaustion, all of which are more elaborate synonyms for neurosis. A careful consideration of the character of these six symptoms is necessary for an ultimate diagnosis.

1. A loss of weight and strength occurs in many diseases, but in only two is it associated with a normal or increased food intake, namely, diabetes and thyrotoxicosis. The thyrotoxic patient loses weight, but has a good if not an increased appetite and rarely complains of stomach trouble. The neurotic individual has a variable appetite and always while losing weight has a poor appetite. He often complains of indigestion, constipation, belching, flatulence and abdominal distress. He has a loss of strength which can be described better as a continuous fatigue. He is tired upon rising in the morning and continues tired until evening. Although he cannot accomplish a day's work, yet he can perform a single act of strength rather easily. A thyrotoxic patient feels better after rest and the profound weakness in his muscles as well as the difference in strength loss and his attitude can often be demonstrated by Plummer's method of having the patient step up on a chair. The thyrotoxic patient attempts it boldly and fails; the neurotic patient attempts it apprehensively and succeeds.

2. The second of these symptoms, tachycardia, when it is persistent and associated with an increased pulse pressure is, in the absence of an aortic regurgitation, pathognomonic of thyrotoxicosis. The neurotic individual has an increased pulse rate but it is not persistent. One day the rate will be 120 per minute, on the next day 90, and with even the small amount of rest necessary to do a basal metabolic rate, it will often drop to 75 or 80. The characteristic blood pressure is 110 systolic and 80 diastolic, and from our experiences such a blood pressure is wholly incompatible with a diagnosis of thyrotoxicosis. The average blood pressure with an exophthalmic goiter is about 150-

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* Read before the Annual Meeting of American Association for the Study of Goiter, Seattle, Wash., July 10-12, 1929.

75 (Plummer)[1] and the pulse rate is constantly fast, while awake and while asleep, day in and day out, week in and week out.

3. Nervousness and tremor are found in so many people as to be of little diagnostic importance. In neurosis the nervousness has been present for many years. The neurotic patient complains bitterly of nervousness, but sits languidly in a chair, enumerating a number of vague complaints. Among these complaints are two which have seemed to me to be proof of an existing neurosis. These are choking in the throat and dizzy spells. Sudeck,[2] in a discussion of neurosis and thyrotoxicosis, has called attention to the frequency, in neurotic patients, of symptoms directed toward the neck, such as difficulty in swallowing, choking, tightness and the like, and the lack of these symptoms in true exophthalmic goiter. Goodwin[3] classifies the symptoms of thyrotoxicosis into two groups, those due to metabolic causes, and those due to neurogenic causes. Among the latter he includes tremor, sweating, tachycardia and emotional irritability. This common assumption may lead one to believe that thyrotoxicosis may exist with only neurogenic symptoms and diagnosis made on this basis frequently leads one into trouble.

Neurologists and psychiatrists often make the statement that there is nothing to distinguish the nervousness of thyrotoxicosis from any other type of nervousness, yet one who is accustomed to examining numbers of patients with exophthalmic goiter can tell, from a patient's overactive behavior alone with a remarkable degree of accuracy, whether he has or has not an elevated basal metabolic rate. Nervousness is accompanied by a tremor of the extended fingers. A tremor is usually present in the neurotic patient, but is nearly always, if not always, present in the thyrotoxic patient. In other words, a diagnosis of thyrotoxicosis can rarely be made in the absence of a tremor.

4. A palpable goiter is present in ninety-five per cent of cases of thyrotoxicosis. In the last three hundred cases of thyrotoxicosis we could find no goiter on palpation in only five of them. Very often the goiter is not visible but it is rare, indeed, that it cannot be felt. There are very few diagnostic signs in any disease which occur in ninety-five per cent of cases, and one is hardly justified in making a diagnosis of thyrotoxicosis in a border line case when he cannot feel a distinct goiter. When a goiter is present, the patient may or may not have thyrotoxicosis. Occasionally, the character of the goiter will be of help. A small diffuse soft thyroid rarely produces symptoms; a diffusely enlarged goiter with the characteristic granular surface and hard consistency is usually toxic. A bruit over the superior thyroid vessels, providing one is sure it is not a carotid bruit or a venous hum, is evidence of a thyrotoxicosis. A nodular goiter, on the other hand, on examination in the office or in the pathologic laboratory, has no charactersitics to indicate that it is toxic or nontoxic. However, in spite of contrary statistical evidence, most surgeons will agree that a nodule no bigger than a walnut is unlikely to produce symptoms. If in a questionable case with a diffuse goiter one administers iodine for a few weeks and the gland becomes a little larger and much firmer in consistency, one can be sure that the thyroid is hyperplastic and toxic. We have tried but have never been able to produce this change in any except exophthalmic goiter.

5. Exophthalmos when it exists is a pathognomic sign. However, as Plummer determined, it exists in only one-third to one-half of the cases with hyperplastic goiters. The greatest difficulty arises in the border line cases in determining whether or not exophthalmos is actually present. It is not infrequent that one physician is sure that the patient has a definite exophthalmos or a definite stare, and another one is sure that he has not. The various eye signs, Von Graefe's sign, Stellwag's sign, Moebius' sign, Dalrymple's sign, usually occur only in the very obvious cases of exophthalmos and are of little help. It may be because of a lack of careful observation that I am unable to elicit these signs with any degree of certainty or to place any diagnostic confidence in them. The stare, of course, occurs before protusion and there is but one constant characteristic of it. In a normal individual the upper lid lies at a level between the upper border of the iris and the upper border of the pupil. If in normal behavior the upper lid is retracted to the upper level of the iris, showing more or less of the white sclera, a stare certainly exists. Exposure of the sclera below the iris is of no significance because normal individuals show a variable amount of sclera between the iris and the lower lid. In a case of doubt it is easy to compare the patient with a normal individual and actually measure the distance of the upper lid from the pupil. Individuals with natural large or protruding eyes never have the retraction of the upper lid. Zimmerman has reported several cases of postoperative exoph-

thalmic goiters, who developed an exophthalmos in spite of normal or decreased basal metabolic rates. I have seen one such case myself. However, one is more or less forced to accept the dictum that, when a stare or true exophthalmos exists, the patient has a thyrotoxicosis.

6. Another diagnostic dictum is that thyrotoxicosis does not exist with a normal basal metabolic rate. Of late, Bauer[4] in Germany and Brams[5] in this country report cases of hyperthyroidism with normal basal metabolic rates and emphasize that other signs and symptoms must be used to arrive at a diagnosis. In a little over a thousand thyroidectomies we have had but one individual who had symptoms suggestive of thyrotoxicosis and a normal basal metabolic rate and who obtained complete cure immediately following a thyroidectomy. In forty-four other similar cases, the operation was followed by little, if any, improvement. So if the patient has a normal basal metabolic rate, we do not operate, and as a matter of safety we consider a normal basal metabolic rate from minus five to plus twenty per cent and even plus twenty-five per cent. Unfortunately, the basal metabolic rate is often between plus twenty to plus thirty per cent in ordinary neurosis, and the reading is of no definite diagnostic benefit, even when repeated a number of times.

The clinical evidence of an increased heat production in such a situation will be of more importance than the laboratory findings of this condition. Baldridge,[6] in an analysis of various symptoms in one hundred toxic goiters, one hundred nontoxic goiters, and one hundred neurotic patients, found warm moist hands in ninety-one of the one hundred toxic cases and in only thirty-two of the other two hundred. Conversely, none of the toxic goiters had cold clammy hands, while over half of the others did. A history of definite heat intolerance is found in about half of exophthalmic goiters but is rarely found in the neurotic. Not only that, but the latter invariably has cold hands and cold feet, an incompatibility in the presence of an increased heat production. Clinical determination of increased heat production is a matter of individual judgment but one can safely say that any individual with suspected thyrotoxicosis who uses a hot water bottle to keep his feet warm will not be benefited by a thyroidectomy. In fact one can be reasonably sure that, if he has cold clammy hands, irregardless of other symptoms, the result will be bad.

The differentiation of these two conditions is so difficult that no sign or symptom should be overlooked, no matter how small nor how infrequent. If still in doubt concerning the diagnosis and if the patient has a small diffusely enlarged thyroid, one can try the therapeutic test with iodine. If the symptoms are relieved in two weeks of iodinization, it is presumptive evidence of a thyrotoxicosis. There are a few signs which are very nearly pathognomonic of thyrotoxicosis. Among these are two which may settle the question. One is the typical and pathognomonic finger nail changes, the other the occasional peculiar orbital edema.

In the hands of the surgeon a diagnosis of a thyrotoxicosis is practically a recommendation of a thyroidectomy and he must be extremely cautious before making such a diagnosis. Although all of the differential points are well known, each surgeon places his confidence in certain particular evidence, much of which is a matter of individual judgment. It is for this reason we have presented the above criteria and have presented it in such a dogmatic manner, in order to indicate those things in which we place our confidence.

In conclusion: A girl, age twenty-seven, single, a comptometer operator or a stenographer for the past seven to ten years, presents herself to the physician. She complains of nervousness for the past two or three years, weakness, loss of weight of twelve pounds in the past three months, palpitation of the heart, difficulty in swallowing and choking in the throat. Her appetite is variable, she has more or less indigestion and constipation. On examination her pulse rate is one hundred and twenty per minute, her blood pressure 125 systolic and 80 diastolic. She has a soft thyroid diffusely enlarged to two times normal size; there is no bruit. There is a definite fine tremor of the extended fingers and the hands feel cold and clammy. The basal metabolic rate is successively plus thirty per cent, plus twenty-six per cent, plus eighteen per cent, and the pulse rate during the last test is eighty-five, the blood pressure 115 systolic and 85 diastolic. There are no other abnormal findings.

One can prove rather conclusively that this patient is suffering from a thyrotoxicosis but, according to our observation, after a thyroidectomy is performed she will not be well. There are left, then, three alternatives: (1) The diagnosis is wrong. (2) The operation is wrong, being either too conservative or too radical. (3) There are cases of thyrotoxicosis which are not benefited by a thyroidectomy. The surgeon will naturally believe the first one to be correct and recommend future thyroidectomies according to his experience.

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## ADENOMATOUS GOITER *

H. W. Riggs, M.D., C.M., F.R.C.S. (E.)
VANCOUVER, B. C.

A survey of the goiter work done in the Vancouver General Hospital during a period of four years shows some interesting facts regarding the types present. The figures deal only with goiters coming to operation and the material was given by one pathologist, Dr. H. H. Pitts, thus eliminating the changing personal equation. It shows that of the goiters, 36.9 per cent were adenomatous, and that 66 per cent of these, or 24 per cent of the total, were fetal adenomata. The figures in my own series are a little higher, fetal adenomata being 33 per cent of the total.

In 50 per cent of these cases the goiter dates back to adolescence, while in others it varies as to time the goiter was noticed. In a great many, swelling of gland was first noticed, following an attack of some trouble like tonsillitis or influenza. In some cases there was no noticeable enlargement until premenopause disturbance occurred. Marine pointed out that fetal adenomata occur most frequently in endemic goiter. However, in a large percentage of cases patients deny having had goiter at that time.

McCarrison claims to have produced an increase of round cells, presumably gland cells, by feeding mice food mixed with fecal matter. This mass he calls adenoma. Other authors have also stated the fetal adenomata, so-called, are the result of the stimulation and multiplication of gland cells and are not the results of fetal rests.

Recently Rienhoff has published the results of an elaborate examination and reconstruction of the thyroid gland, both in the normal condition and in hyperplastic states. He stated definitely that he did not find any trace of the so-called interstitial cells or of fetal rests. This is rather upsetting to the fetal rest theory of the origin of fetal adenomata. However, it may be interesting to trace the development of the thyroid through the vicissitudes of its career in relationship to adenomatosis.

The fetal thyroid is a mass of cells with a tendency to form, first, cords, later follicles, lined with cubical epithelium. Early the epithelium secretes colloid, while all that can be seen are tiny dots in the follicle. As the gland matures, some of the follicles increase in size, but in childhood the larger number are still small and, if the presence of colloid is any criterion of activity, they are rather inactive. Apparently nature does not require the full development of all the follicles, but as there is call for secretion, or some stimulus chemical or bacterial, the reserve acini are brought into function. Thus even in colloid goiters we find areas where there are small functioning acini. When under stimulus, there is an increased activity of these reserve cells generally; there is what is called an adenomatosis, the final stage of which is general colloid formation.

Fetal adenomata must be accounted for by going back to the fetal thyroid. For some unknown reason a mass of the fetal cells does not go through the usual stages of development, but under the same stimulus as takes place in endemic goiter they begin their growth, being found as small nodules in the thyroid lobe. Further development of these nodules may not occur until the fourth or fifth decade, when under some form of stimulation, they begin to grow. Then the cells of the follicle become active, stain deeply and, passing from one stage to another, contain more and more colloid. There is evidence of interference with the circulation as the interacinal tissue becomes edematous.

It has been stated that fetal adenomata do not give rise to symptoms. But in my series, which is chiefly of the intermediate type, there has been definite toxicity. It is possible that conditions which accounted for the growth of the adenomata also meant increased activity in the other undeveloped follicles of the gland. The chief symptom was lack of energy, accompanied by tachycardia. In some

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long standing cases the heart had become irregular. Excluding cases where there is hyperplasia of the normal acini, the average pulse pressure was 49 mm., only slightly above normal. This is in contrast to the cases where hyperplasia has resulted in a more intensive type of toxicity. The metabolic rate averaged plus 30. The nervous element, although marked, is of a moderate type. In fact, the whole of the picture is that of a moderate hyperthyroidism.

The preoperative treatment of these cases consists usually in a nerve sedative, some form of bromide. I think it is a mistake to give iodine to these moderate hyperthyroids, as I have had some cases in which it has intensified the symptoms. Iodine should be reserved for those cases of a mixed type, where an old adenoma shows marked nervous symptoms, rapid heart and a high pulse pressure indicative of hyperplasia.

As to operative procedures, only one or two points may be mentioned. Fetal adenomata may be in both lobes and accompanied by considerable colloid formation in the parenchyma of the gland. It is necessary to save as much normal looking tissue as possible, in order to prevent postoperative hypothyroidism. Usually this tissue is found towards upper pole. If so, the superior thyroid artery should not be ligated. The other point is that in old adenomatosis cases prolonged drainage is necessary. Even then, a definite infection of the subcutaneous tissue may occur, giving support to the finding of bacteria in the glands by Cantero and Houda.

All cases of adenomatosis should be watched for some time following operation, as hypothyroidism may develop and small doses of thyroid may save your reputation as a surgeon.

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Operative Mortality in Hyperthyroidism. Howard M. Clute, Boston (*Journal A. M. A.*, Aug. 9, 1930), discusses the mortality in a large series of cases operated on in a well known Eastern clinic. During a five year interval, 2,128 patients have been operated on for primary hyperthyroidism, with fourteen deaths, a mortality rate of 0.65 per cent. In the same five years 641 patients with toxic adenomatous goiter have been operated on with twelve deaths, a mortality rate of 1.87 per cent. The total number of patients during these five years who have been operated on for hyperthyroidism is, therefore, 2,769. Of this number twenty-six died, a mortality rate for all patients with hyperthyroidism during the five year interval of 0.93 per cent. Further reduction of the operative mortality in hyperthyroidism below its present low figure can be accomplished by the recognition of the fact that most unexpected mortality arises in patients (1) of 40 years and over; (2) weighing in the neighborhood of 100 pounds, or having large losses in weight and (3) having had well marked hyperthyroidism for more than a year. Thyroidectomy in these patients should in most instances be divided into stages, even though the patient's course on the table seems to warrant the complete procedure.

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# HYPERTHYROIDISM

## REMARKS ON ITS MANAGEMENT [*]

LeRoy Long, M.D., F.A.C.S.
OKLAHOMA CITY, OKLA.

The term "hyperthyroidism" is employed to indicate a condition that is characterized pathologically by hyperplasia of the thyroid gland, with disappearance of its colloid and reduction of its iodine content, together with tissue waste. It is characterized symptomatically by rapid heart, weakness, tremor, restlessness, with or without exophthalmos and demonstrable enlargement of the thyroid gland. In hyperthyroidism there is hyperfunction of an abnormal gland, through which the normal and useful secretion gives place to an abnormal and highly toxic secretion.

Notwithstanding the doubtful etiology, we are now able to say that the management of the patient who has toxic goiter has been systematized so that, by bearing in mind the pathology and the altered physiology, and by giving the proper relative values to clinical signs and symptoms, it is usually possible to carry out therapeutic procedures that bring definite and satisfactory relief.

In the present state of our knowledge, there would seem to be good warrant for the statement that toxic goiter is cured by the surgical removal of the greater part of the abnormal thyroid gland, and by measures directed to the restoration of normal function in the part of the gland that remains. Other proposed procedures, such as treatment by roentgen-ray and the injection of chemical agents into the gland are uncertain, misleading and dangerous. But the success of the surgical operation depends very largely upon the adequate preparation of the patient before operation, and definite management after operation.

### PREOPERATIVE MANAGEMENT

In our work we have found it helpful to talk to the patient with frankness. We are not able to see either the necessity or the wisdom of mysterious and clandestine procedures. The average patient wishes to know about the disease and what the surgeon intends to do. When a definite plan is outlined, there is peace of mind and cooperation that we are not able to secure in any other way.

In the preoperative management of toxic goiter there are five essential requirements. They are rest (including the ability to sleep), an adequate amount of water, sufficient and proper food, fresh air and iodine.

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Water, food and fresh air are essentials about which there is no controversy. Their importance is of a primary and basic character. This is particularly true in the case of the patient whose tissues are burning up as a result of the relentless activity of hyperplastic thyroid disease. It is so true that in order for the patient to have sufficient water, sufficient and proper food, sufficient fresh air, explicit orders must be given and carried out.

Here we wish to make some remarks about the use of iodine, the means to secure rest and sleep, and the value of water.

As we see it, iodine is an agent of great value that has distinct limitations. It is an agent, moreover, that is not always employed with wisdom and discretion.

There is general agreement about the value of iodine in preparing a patient who has a toxic goiter for operation, but there is still some difference of opinion about the harm that it may do, if given over a long period of time before operation. We are convinced that it does do harm. When a patient comes to us without previous iodine treatment, it is given with the greatest confidence, for almost invariably its administration assists in relieving the toxemia. When a patient comes who has had iodine over a long period of time, we give it with a feeling of doubt, exasperation and uncertainty, because it has been our experience that it is impossible to secure a satisfactory response in such a patient. Practically the only patients upon whom we now find it advisable to perform partial and multiple operations are those whom we are unable to prepare because of previous unwise administration of iodine.

It has been shown that certain definite changes take place in the hyperplastic thyroid when iodine is administered. The first effect is the stimulation of the cells through which colloid is produced. The acini become filled with colloid. This is the typical favorable response to iodine. If its administration is continued, there follows exhaustion of the gland, and the temporary supply of colloid disappears.

The administration of iodine is not for the purpose of simply and directly making up the iodine deficit. If that were true, it would only be necessary to determine the amount required in the individual case and continue it in order for the patient to be relieved. It is employed on the theory that it assists temporarily in modifying the toxicity of the abnormal thyroid secretion.

While it has been clearly proven that iodine is a most valuable agent for the modification of the toxemia resulting from the abnormal function of the hyperplastic thyroid, it must not be looked upon as a panacea. Coincident with its employment, other essential measures ought to be carried out. Indeed, there are occasional situations where iodine distinctly occupies a place of secondary importance. The patient with vicious disturbance of the gastrointestinal tract is an example. There is acidosis with persistent vomiting, diarrhea, insomnia, emaciation. Here the acidosis must first be relieved.

A woman, 46 years of age, never pregnant, the wife of a banker who was carrying a pretty heavy load during a critical period, and who took his business worries home with him, developed a rapid heart, tremor, loss of weight and strength. About the same time she went through a strenuous period of house cleaning. This was followed by nausea, vomiting, great weakness, insomnia, emaciation.

She was taken to a hospital, where many things were done in an effort to find out what was the matter with her. Attention seemed to have been centered on the gastrointestinal tract. There were analyses of the stomach contents, roentgen-ray examinations of the gastrointestinal tract and other more or less elaborate procedures. Among other things, there was a recorded basal metabolic rate of plus 70, but it seemed that nobody paid any attention to it, because there was no demonstrable enlargement of the thyroid and there were no eye symptoms.

Here was a situation where iodine had to take second place. It was obviously necessary to first relieve the acidosis. Glucose intravenously, water under the skin, morphine as necessary for sleep and rest were followed by relief of the gastrointestinal symptoms. Then iodine was added, and the patient was satisfactorily prepared for a thyroidectomy.

In the management of thyroid crises nothing is of more importance than the employment of means to produce rest, that includes the ability to sleep. The patient, who is able to lie quietly in bed without worry, and to sleep long hours without interruption, occupies a position of tremendous advantage. If the toxic patient is strong enough, he is constantly moving about. If he is too weak to move about, he lies wide awake in bed. He has no rest.

In this condition there is too great a tendency to use makeshift procedures. The bromides are given, but they do no good. The barbital preparations are no better. We believe that the exigencies of the situation demand agents of unquestioned and effective potency. Morphine meets that requirement and we give it without hesitation.

### POSTOPERATIVE MANAGEMENT

In the case of the average patient, where it has been possible to carry out a more or less ideal preoperative management, and where the operation has been properly done, the postoperative management is relatively simple.

But there are at least a few patients where, because of previous unwise medication over a long period of time, or because of unusual toxemia, it is impossible to adequately and ideally prepare them for operative procedures. In an effort to save life it is necessary to operate upon an occasional patient who is still struggling against a vicious toxemia. In such a situation the management after operation is an acute problem, the successful solution of which requires definite and ceaseless care. The battle is not long, but it is furious while it lasts. Watever is done must be done quickly.

In such a patient the narrow margin of safety has been encroached upon by the necessary operative procedure. There is usually pronounced acidosis. There is practically always a temporary hypoglycemia. There is always superlative sensorial irritation with unstable control through the nervous system.

Here stimulation of the exhausted thyroid gland will not help. One must fall back upon the use of means to relieve the acidosis, means to make up the sugar deficit, means for the amelioration of sensorial irritability, and for the support and strengthening of control through the nervous system.

With acidosis there is an absence of the required water supply. The cells of the body, of all the vital organs of the body, in which reside ultimately the powers of recuperation, strength and function, cease to function, and myriads die because they have been bereft of an agent that, next to oxygen, is the most indispensable to life and function. The patient, then, in the crisis after operation should have water, and it should be given by a route that will insure its absorption. Normal saline solution under the skin is effective. From 1000 to 1500 c.c. should be given every four to six hours until there is improvement, and the patient is able to drink water freely and with comfort.

If there is vomiting with acetonuria, glucose is given by intravenous infusion. If enough water is given in the proper way, and if proper means are employed to relieve sensorial irritation, it is not usually necessary to repeat the infusion of glucose.

But even with a sufficient amount of water, the patient will not do well unless the irritability of the nervous system is relieved. For this purpose, just as in the crisis before operation, we believe that morphine is the most appropriate agent. In the postoperative crisis its free employment is often a matter of urgent necessity. We know of nothing else that so effectively meets the requirements. We know of no other drug or procedure that so surely and harmlessly gives peace and rest, comfort and sleep. No argument can be brought against it except the danger of addiction, and when that slight danger is weighed on one side, and the danger of the crisis that threatens life is weighed on the other side, it shrinks into insignificance.

In the management of the thyroid crisis, it is unwise to resort to a multiplicity of procedures without clear discrimination based upon relative values. While it may be necessary, in order to meet specific indications, occasionally to employ other means temporarily, our faith rests in the main upon what we believe to be two indispensable agents—water and morphine.

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# COMPLICATIONS FOLLOWING THYROIDECTOMY*

Norris W. Gillette, A.B., M.D., F.A.C.S.
TOLEDO, OHIO

It is my opinion that the better the management of patients suffering with thyroid disease both before and during the operation, the fewer will be the postoperative complications. A large percentage of postoperative complications can be avoided by proper preparation and good surgery. So many thyroidectomies have been done that it is now possible and better to compute results from many hundreds rather than from a few cases.

The mortality rate in the best surgical clinics is as low as it can be made with the present state of our knowledge, when we consider the multitude of possible causes of death beyond our control. This death rate has rather evenly diminished throughout the country in the last fifteen years in the hands of the best operators, as a result of developing better preoperative treatment and a somewhat standardized thyroidectomy. But the operator who is performing a few thyroidectomies a year is not approaching this low death rate of the larger clinics because of the lack of necessary experience and the tendency to hurry the operation before the patient is properly prepared.

There are certain complications following thyroidectomy that fall to the lot of every goiter operator. The first one that shows itself postoperatively is the reaction from the operation. The better prepared the patient has been for operation the less severe will be this reaction. It is with great difficulty that some patients are brought within the range of operability, and it can confidently be predicted that trouble will ensue. The height of the reaction does not seem to come until thirty-six to forty-eight hours after the goiter has been removed and in the next two days the danger from this cause is the greatest. The temperature rises and the pulse accelerates occasionally to 160 or even more. Three things are important at this time. First, morphine is given to keep the patient resting; second, Lugol's solution is administered and, third, large quantities of cold water are forced.

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Enough morphine is administered to quiet the patient and this is sometimes very large. These patients tolerate morphine well. A quarter grain of morphine every hour or two may, if the patient is very toxic, make her sleep but still be restless. This drug should be continued until the pulse comes down and the restlessness disappears.

Lugol's solution has the same effect postoperatively as it had before the operation. It is given in very large doses and aids materially in reducing the postoperative toxicosis. Thirty minims every three hours by mouth is taken by the patient and 1 dram of Lugol's every twelve hours in six ounces of mineral oil injected per rectum. In addition it is at times added to the hypodermoclysis.

At least one hundred ounces of cold water every twelve hours by mouth is required. With the patient asleep from morphine it is often difficult to give this amount of liquids by mouth, and we have the additional trouble of difficulty in swallowing. Frequently a nasal catheter passed into the esophagus and left in position is used with the advantage that as much water as is desired can be introduced into the stomach and as often as necessary. This is not particularly annoying to the patient and can be left for forty-eight hours or more if necessary.

Paralysis of one or both of the recurrent laryngeal nerves may be very troublesome. Complete loss of voice may occur that has lasted in different instances from three weeks to a number of months, but if the nerve has not been severed the voice will become normal. Very rarely there may be a paralysis of one vocal cord before the operation and this should be searched for preoperatively in husky voiced people. Pressure of the goiter on the recurrent laryngeal nerve has caused paralysis of it. I do not believe that at operation the recurrent laryngeal nerve is cut frequently, but due to its position and to its short attachment to the capsule, it is frequently partially paralyzed by the too much rotation of the gland in exposing it for removal. Many more nerves are paralyzed than are cut.

In those cases in which one or both of the recurrent laryngeals have been cut, there is no regeneration and we can expect no improvement in the voice whatsoever. In addition there is difficulty in breathing which becomes worse rather than better and it becomes necessary to open up the air passage. A portion of the vocal cord has been removed by bronchoscopic surgeons, and nerve transplantation which again gives tonicity to the cords has been tried, but the ultimate results have not been good. So-called collapsed trachea is in reality a severing of both laryngeals with a closure of the air passage.

In removing the gland the general condition of the patient must be the deciding factor as to the amount of tissue that should be left for the best results. In the main, I believe that the patient with severe thyrotoxicosis should have a subtotal thyroidectomy performed. Failure to remove enough gland often exposes the operation of thyroidectomy to criticism by both patient and practitioner. For a time the patient may do well, due to the disturbance in the blood supply and a temporary inactivity of the thyroid cells. If too much tissue has been left, within a few months the gland resumes its activity and the patient's metabolism increases with all the previous symptoms of goiter activity. The patient must then again come to operation to relieve the distress. It is not particularly difficult to remove the anterior portion of the gland, but to properly perform a subtotal thyroidectomy necessitates an exact anatomic knowledge in careful dissection to avoid trouble on the posterior capsule. In large goiters with a relatively low toxicity, a good portion of the thyroid can be left without danger. But with small and extremely active goiters it is almost impossible to remove too much of the gland as the few cells that are left on the posterior capsule and in the sutures and ligatures will carry the patient along without hypothyroidism.

Secondary operation is more difficult than primary because the planes of cleavage have disappeared and adhesions distort the normal anatomy, so that in attempting to do secondary subtotal thyroidectomy it is not difficult to go through the posterior capsule. The metabolism in these cases, no matter what it has been previous to operation, does not go usually as high as it originally was, due to the fact that a part of the gland has been removed and the blood supply to the remainder has been interfered with. However, it remains constant and keeps the individual in an invalid condition.

Hypothyroidism following thyroidectomy is of various grades. The moderate degree of cachexia strumapriva, in which the patient puts on a few pounds extra weight, is not important. It is only important when, in those cases in which a great deal of weight is put on, the patient becomes sluggish and the mentality dull. Thyroid extract, three or four grains a day, generally controls these patients well, and makes the removal of too much gland of less importance.

After a great many thyroidectomies there remains for a period of time some nervousness, irritability and a feeling that the operation was not a complete success. This is due to an imbalance of the endocrines. The glands of internal secretion being dependent upon each other, the sudden removal of the thyroid leaves a condition which takes a period of time to cure. But the time is shortened by the giving of sodium iodide intravenously once or twice a week. The patients recover very rapidly.

At times the skin becomes adherent to the subjacent tissues. This is particularly ugly in appearance and is very annoying to the patient. Occasionally the patient feels as if there was a tight band around the trachea when this condition is present. This is generally due to improper suturing of the prethyroid muscles and facia. Frequently after a period of time the condition improves with the aid of massage. Very seldom will it be found necessary to again raise the skin flap and loosen the adhesions.

In removing the thyroid care must be taken as to what portion is left. The remains of the thyroid hypertrophies and, if a portion of the isthmus is left, an ugly lump in the midline may ensue. It is, therefore, better to leave whatever must be reserved on the posterior capsule, where the hypertrophy will not show. Also a pyramidal lobe which has not been removed will cause this same condition.

Tetany following thyroidectomy has been the subject of a great deal of study. I have had three cases in my practice, one of six years standing, one of three years and one of three months. The first case became symptomatically free with the use of calcium lactate in about three months. She had occasional light recurrences of her symptoms, however, for a period of two years, especially at menstrual periods or if she had a severe cold. These symptoms then disappeared entirely and her blood calcium was normal until about five years after the incidence, when she became pregnant with a recurrence of her symptoms. She needed very little parathyroid-hormone, however, to bring her back to normal and her blood calcium is now normal. A large parathyroid was found buried in the thyroid tissue.

The second case has lasted three years. Her blood calcium can be brought up to ten mg. per 100 c.c. of whole blood by intravenous calcium and hormone. But the treatment must be continued. She is now being given viosterol in milk, with the expectation of eventually eliminating the hormone, and calcium. Her parathyroid was on the anterior surface of the trachea just above the isthmus and was removed with it. It was not recognized as a parathyroid until the tetany developed and it was searched for.

In the third case, three months ago, the patient developed tetany within a few hours after the operation. The gland was carefully searched for parathyroid tissue but none was found. She was given hormone daily for a week and then once a week for four weeks. No treatment has been given since. Her blood calcium is normal. Evidently the operative procedure had temporarily disturbed the blood supply to a large parathyroid and tetany was present until this blood supply was reestablished. In some cases tetany eventually takes care of itself, because the remaining parathyroid tissue which is distributed in this area hypertrophies and assumes the burden of the missing parathyroid tissue. The technic of leaving as large a portion of lateral capsule as possible prevents damage to most parathyroids.

Mental aberrations due to thyrotoxicosis are frequently present in cases of long standing both before and after operation. The patient may be on the verge of developing a mania at the time of operation which develops in full force a few days postoperatively. The patients not only become wildly excited, but become confused. Frequently the condition simulates paranoia. There are delusions of persecution but not often disorientation. If the condition has not been of long standing, the improvement is rapid. The peak of the severity comes a few days after operation and is followed by improvement. If the patients have had mental disturbances before operation we cannot expect much immediate improvement postoperatively. Some of them will need confinement in an asylum for a period of time. In the main, after a period of months they improve and are able to resume their normal existence. Occasionally the mania is permanent, however. The treatment is rest and confinement and large amounts of iodine. After an unfortunate experience or two, in which patients have attempted suicide, at the first sign of mania loose anklets and wristlets are applied to keep the patient in a prone position.

Brain embolism can and does occur. I have had one case, in which four hours after the uneventful removal of a large nontoxic adenoma the patient suddenly expired from this cause. In other cases of this nature which I have been able to trace the embolism has occurred three to six days postoperatively.

Tracheitis in greater or lesser degree is a very common postoperative complication. The close adherence of the gland to the trachea makes it difficult to remove without tracheal irritation. There develops an edema of the lining mucosa with inflammation. In severe cases the edema is great enough to endanger life through obstruction and the epiglottis may be edematous. The best treatment is a steam inhalation tent with compound tincture of benzoin or hydriotic acid. The very rare postoperative pneumonia that may occur may be treated in the same way. The use of nitrous oxide and oxygen gas and novocaine or ethylene have practically eliminated pneumonias following thyroidectomy.

Postoperative hemorrhage occurs from the cut surface of the gland from a slipped ligature, or from a vessel that has been clamped and not ligated but opens up when the patient awakens after operation. It is important to leave the operative field dry, as hemorrhage does not readily take care of itself. The method of bringing the patient out of the anesthetic partly so that she may cough and bring to light a temporarily stopped hemorrhage may obviate the necessity of a secondary operation later for hemostasis.

Keloids occur in the scar in those individuals who are susceptible to keloid formation, and because of the location of the growth is particularly unsightly, even if not harmful. To obviate the likelihood of this keloid growth it is a routine to expose each patient on the fourth day after operation to one-half an erythema dose of roentgen ray. This prevents the exuberant fibrous growth and makes a clean scar without keloid formation.

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# PREVENTION OF POSTOPERATIVE RECURRENCE IN THYROIDECTOMY*

J. Earl Else, M.D.
PORTLAND, ORE.
Clinical Professor and Chairman, Department of Surgery, University of Oregon Medical School

The responsibility of the physician in the treatment of goiter does not end with the relief of the patient of the disease which is present at the time of treatment, but includes protection as far as possible from a recurrence of that disease at some later time. To do this means, first, that the disease must be eradicated and the patient given a normal thyroid gland; and, second, the gland must be kept normal.

If restoration of the thyroid gland to normal is the first step in the establishment of a permanent cure, it is quite obvious that any measure which merely checks the excessive secretion of thyroxin or which leaves a considerable portion of diseased gland will not meet the requirements. It is for this reason that rest and drugs, roentgen therapy, and incomplete surgical procedures have been followed by such a high percentage of recurrences. All three of these methods are followed by immediate relief in a majority of cases, a cure in some, but recurrence in too high a percentage. Likewise, in patients who have had a perfect operation but without adequate preoperative and postoperative care, the percentage is higher than need be.

The reduction of recurrences to the irreducible minimum depends upon (1) careful preparation, (2) adequate removal of diseased thyroid tissue, and (3) proper postoperative treatment and supervision.

In the preparation of a patient for a goiter operation, two factors must be considered; first, reduction of the mortality and morbidity hazard; and, second, preparing the gland for regeneration. Owing to limited time the former will not be considered in this paper. The latter was studied a few years ago in conjunction with postoperative treatment upon dogs and rabbits in the Department of Surgery in the University of Oregon Medical School. As the result of that work, we concluded that for the most satisfactory regeneration, the thyroid should be saturated with iodine at the time of operation. The amount of iodine to be given and the length of time over which it should be given were not worked out. Empirically we have fixed upon ten minims of Lugol's solution three times a day for not less than two days in patients in good physical condition with nontoxic goiters. In patients with toxic goiter, it is given in such amounts and for such a time as the degree of toxicity indicates.

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* Read before the Annual Meeting of American Association for the Study of Goiter, Seattle Wash., July 10-12, 1930.

The amount of thyroid tissue to be removed at operation has been the subject of much discussion. This problem was also studied and we found that the thyroid has such a marked reserve that it is possible to remove a considerable portion of it without any or only a very limited regeneration. This means that, so long as enough thyroid substance is left to easily produce the necessary thyroxin, there will be either no or only a very limited regeneration. When the amount left is less than the amount needed to produce the necessary thyroxin, regeneration always takes place. Not exactly, but in a more or less general way, regeneration was found to vary inversely as the amount of gland left.

After having studied the effect of operation upon the thyroid without iodine administration, we studied the effect of operation upon animals given iodine and found that, when it was given, a larger portion of gland could be removed without regeneration than when the animals were upon an iodine-free diet. We found, further, like those on the iodine-free diet, that when the amount left was less than the amount needed to produce the necessary thyroxin, regeneration occurred and this roughly varied inversely to the amount left.

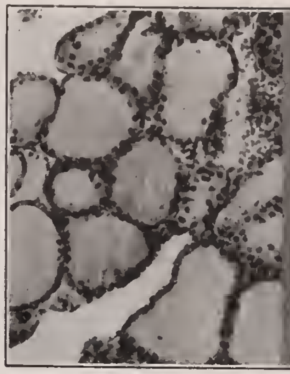

Fig. 1.

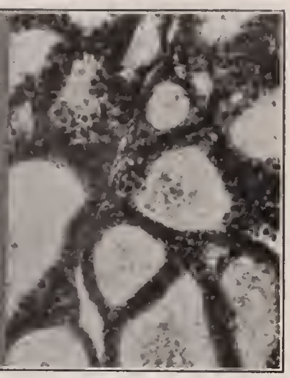

Fig. 2.

Fig. 1. Dog's thyroid at the time of removal of the greater portion of the thyroid gland.

Fig. 2. Section from the same dog's thyroid as fig. 1 twenty days later, showing hypertrophy and hyperplasia. This dog was given no iodine. In the dog that was given iodine, the reaction was usually complete between three and four weeks.

We studied the effect of iodine upon the rate and duration of the regeneration and found that in the animals receiving iodine, regeneration was usually complete in three weeks and with one exception was always complete in four weeks; while in the animals not receiving iodine, it was usually very active in four weeks (figs 1 and 2), and in two dogs the regenerated thyroid became larger than the original thyroid (figs. 3, 4, and 5) or, in

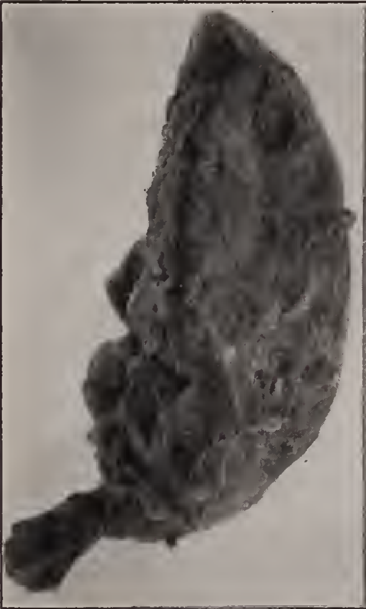

Fig. 3.

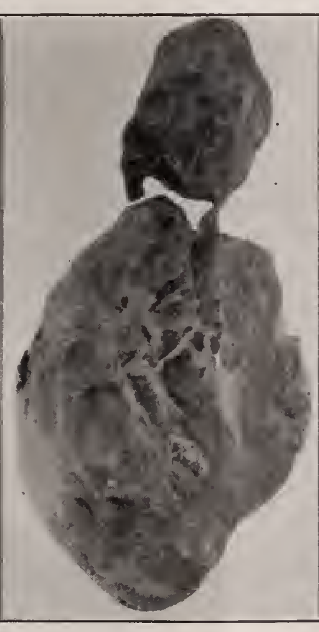

Fig. 4.

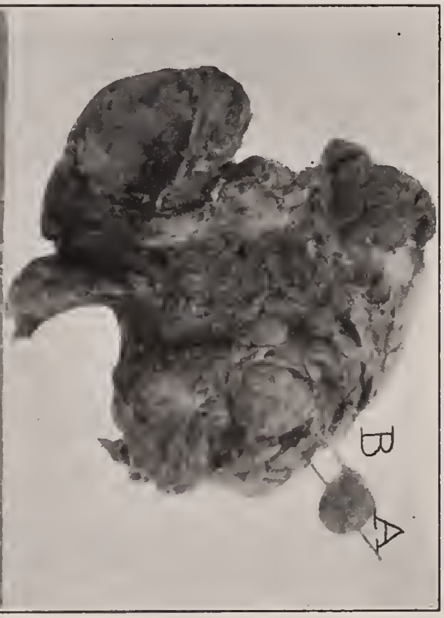

Fig. 5.

Fig. 3. Dog's thyroid at the time the major portion of the gland was removed.

Fig. 4. Section from the same dog's thyroid as in fig. 3. thirty-five days after removal of the major portion of the gland, showing marked increase in colloid, hyperplasia and formation of new acini.

Fig. 5. A higher power of the same as fig. 4, showing hyperplasia and hypertrophy of the cells. This dog received no iodine. At the end of thirty-five days this dog's thyroid was considerably larger than at the time of operation.

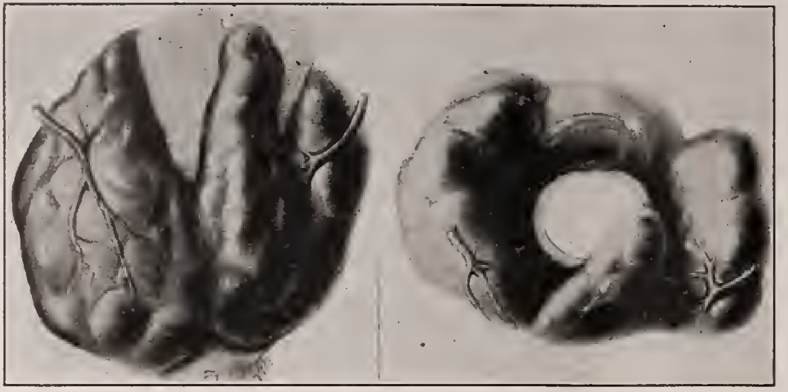

Fig. 6. Drawing from thyroid removed at operation showing (1) retrotracheal extension completely encircling the trachea. The superior poles lay posterior to the trachea. (2) The superior thyroid artery entered the lobes at nearly the level of the isthmus instead of at the superoir poles. (3) Pyramidal lobe. (4) Thickened isthmus.

other words, because of the iodine deficiency, there was such excessive hyperplasia that goiters developed. We also studied the amount that could be removed and found that, as long as any appreciable amount of thyroid was left, regeneration always took place.

In applying the results of our studies to the treatment of goiter, we concluded, first, that it was safe to remove practically all of the goiter, leaving only a thin layer of the gland upon the posterior portion of the capsule on each side. We believe it best to remove all but this thin layer as otherwise too much diseased gland would be left. Second, iodine should be given during the regenerative period to prevent excessive regeneration. As regeneration was not complete in one dog receiving iodine in four weeks, we are giving it for eight weeks. The amount of iodine needed is not known. We give ten minims three times daily the first month and once daily the second. This amount we have found to be enough. It may be too much but as it does no harm we believe it better to give too much than run the risk of too little and get a recurrent goiter.

Anatomic variations should always be looked for, as they may be responsible for a failure to secure a cure of the disease, the development of unpleasant regenerative masses or recurrence. We have found five congenital anomalies: superior accessory thyroids, persistent pyramidal lobes, thick isthmuses, retrotracheal extension and projections from the inferior poles or isthmus; and two acquired anomalies, extensions and extrusions.

Superior accessory thyroids may lie anywhere between the isthmus and the base of the tongue and externally as far as the ramus of the lower maxilla. When present they should be removed in their entirety when there is no other thyroid tissue present.

Pyramidal lobes (fig. 6) should be completely removed, as regeneration in this location may produce an unsightly mass. The isthmus should also be completely removed for the same reason. The posterior capsule of the isthmus should be removed, leaving the trachea bare, for if left, traction from scar tissue of the regenerative lobes may take place, giving an unpleasant sense of constriction.

Before the beginning of the subtotal lobectomy, the lobe should be seized with vulsellum forceps and rotated toward the midline, thus pulling out and exposing retrotracheal extensions (fig. 7). As the subtotal lobectomy is being done, these can be inverted into the lobe and the greater portion of the thyroid substance removed without endangering the recurrent laryngeal nerve or parathyroid bodies. Inferior projections are removed with the lobe or isthmus to which they are attached.

Extensions and extrusions are acquired variations, due to the expulsion by compression of adenomas developing just below the surface of the thyroid, much the same as a subserous fibroid is protruded from the uterus. If the protruded mass is attached to the thyroid by thyroid substance, we

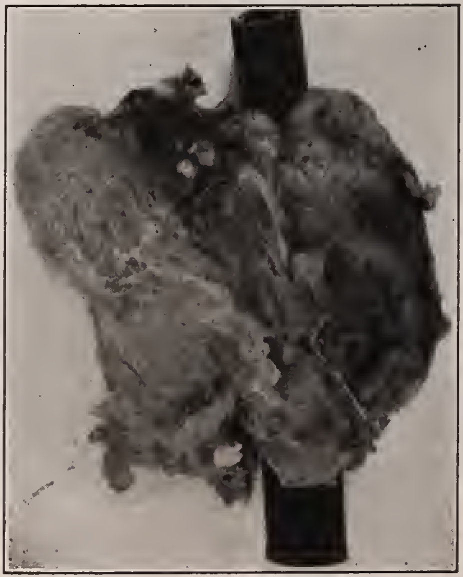

Fig. 7. Retrotracheal extension. The rubber tube marks the site of the trachea.

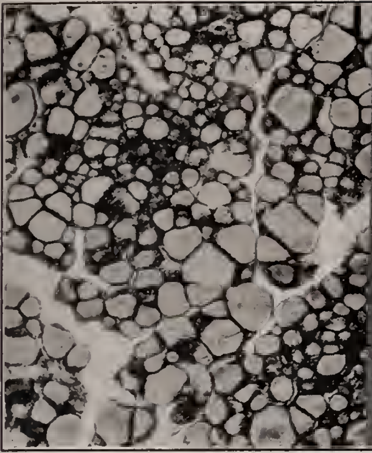

Fig. 8.

Fig. 8. Lobe of thyroid showing extension at the lower pole.

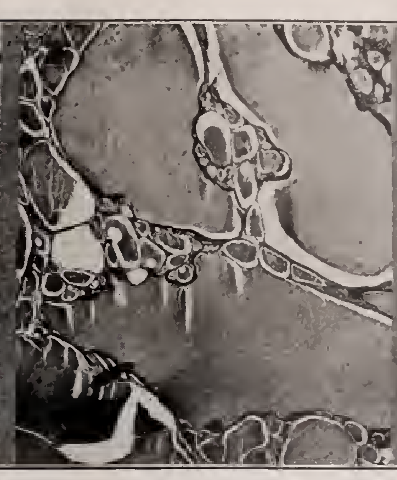

Fig. 9.

Fig. 9. Lobe of thyroid with an extrusion at the lower pole.

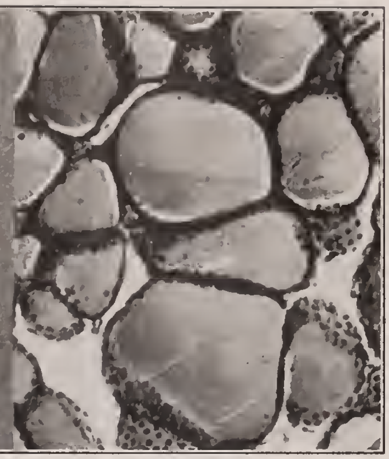

Fig. 10.

Fig. 10. Extrusion on the side of the lobe.

have called them extensions (fig. 8), but if held only by the capsule, extrusions (figs. 9 and 10). The capsule may give way, leaving them free. This is, I believe, the origin of the so-called inferior accessory thyroids that are not malignant. They should always be searched for and removed.

Reference has already been made to the necessity of giving Lugol's solution during the regenerative period, but the supervision of patients operated upon must not stop with the completion of the regeneration of a normal gland. A deficiency in the iodine intake may result in the development of a subsequent goiter in just the same manner as a deficiency results in the development of the original goiter. After the regenerative period, the patient should be instructed either to use iodized salt for both table and cooking use, or to take a ten milligram iodine tablet weekly.

The careful preparation of the patient before operation, giving sufficient iodine to have the thyroid saturated at the time of operation, the removal of all of the thyroid substance except a thin layer on the posterior of the capsule, the search for anatomic variations and their removal, the giving of iodine during the regenerative period, and the inclusion of a sufficient iodine intake in the diet thereafter will give the thyroid gland the best opportunity to undergo a normal regeneration and to remain normal thereafter and thus prevent recurrences.

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Ureteroperitoneal Fistula, with Urinary Ascites and Chronic Peritonitis. Guy L. Hunner and Houston S. Everett, Baltimore (*Journal A. M. A.*, Aug. 2, 1930), report a case of a nulliparous colored woman, aged 34, who entered the clinic because of pelvic discomfort chiefly on the left side, menorrhagia during the two previous monthly periods and moderate leukorrhea. Clinical and operative examination revealed multiple uterine fibroids and chronic pelvic inflammatory disease as the evident cause of the patient's complaints. There had been no symptoms referable to the urinary tract, but subsequent events showed that the patient had probably had bilateral ureteral stricture previous to admission of long duration which had given rise to the gastrointestinal symptoms. An operative injury to the right ureter was apparently due to the passage of the needle and a catgut suture through the lateral wall of the ureter in the act of tying off the right ovarian vessels near the pelvic brim. This suture gradually sloughed through the ureteral wall and resulted in urinary leakage, which on the eleventh day found its way extraperitoneally to and out through the cervical stump, giving rise to incontinence, which was interpreted as being of urethral origin. At the same time there was probably some leakage directly from the ureteral fistula into the peritoneal cavity, as indicated by the high temperature and general symptoms. About seven weeks after the operation and three weeks after the patient's discharge, the ureteral-extraperitoneal-cervical fistula ceased functioning, and the urine was shunted into the peritoneal cavity, as evidenced by cessation of the incontinence for one day and the development for several days of all the signs and symptoms of a severe peritonitis. About three weeks later the cervical urinary drainage ceased permanently and the abdominal symptoms returned, and when the patient presented herself a week later she had the marked abdominal distention for which the authors subsequently operated. At a repair operation three months after the primary operation they found the fistula near the pelvic brim, involving the outer wall of the slightly dilated ureter; and on attempting to pass dilators from the fistulous opening to the bladder they were surprised to encounter a dense annular stricture about 15 mm. below the traumatic fistulous opening. Had this stricture not been present with urinary stasis and tension above it, it is quite possible that the ureteral lumen would have continued to drain with sufficient volume to allow the natural forces of repair to take care of the later ureteral injury without the formation of a fistula. Experience has shown that ureteral stricture is practically always bilateral, and it was this knowledge that later, during the patient's convalescence, led them to investigate the left ureter. The discovery of bilateral stricture placed them in a position to hasten not a little the patient's recovery to complete health, including the cessation of previous annoying digestive disturbances.

# HYPERTHYROIDISM AND HYPOTHYROIDISM AFTER 2,500 THYROIDECTOMIES*

ADDISON G. BRENIZER, M.D.
CHARLOTTE, N. C.

This series of 2,500 thyroidectomies includes unilateral and bilateral lobectomies in 1,482 cases of exophthalmic goiter, and enucleations, unilateral and bilateral resections and dissections in 1,018 adenomata, cysts, simple goiter and thyroiditis.

Females predominated in the proportion of 2,238 to 262 males.

Deaths occurred in 12 cases, 10 of exophthalmic goiter and 2 of adenoma. There were 3 late deaths in cases of recurrent carcinoma, which has made up about 1 per cent of the group of 1,018 cases.

There were 47 cases operated on elsewhere in the whole series of 2,500, requiring a second operation by us. Of the 2,500 cases operated on by us 13 cases, 9 of exophthalmic goiter and 3 of adenoma, have required reoperation, and 2 of these were reoperated on twice on account of hyperthyroidism. The metabolic rate in all of these cases was above plus 40.

We have found but one case of permanent hypothyroidism following all operations for exophthalmic goiter and toxic adenoma and certainly no case of myxedema. There have been, however, a number of cases of transitory hypothyroidism which have finally stabilized by withdrawal of postoperative iodine administration or the taking of thyroxin over a short period of time. There has been one death from severe and persistent hypoparathyroidism and tetany, and three cases who showed mild transitory symptoms of hypoparathyroidism. There is no case of permanent aphonia. There are, however, four cases with alterated voices and lameness or paralysis of one vocal cord.

In the 13 cases where second or third operations were done and 2 operated on twice, making 17 second or third operations on 13 cases, all but one have returned to a satisfactory state of thyroid stabilization, judged by clinical symptoms and metabolic rate. There is no evidence of hypothyroidism, nor hypoparathyroidism, nor alteration of voice after these 17 secondary thyroidectomies. The one case, after three thyroidectomies, is still mildly hyperthyroid with metabolic rate of plus 24, but her clinical improvement is altogether satisfactory.

Our operation in cases of exophthalmic goiter for the last fifteen years, has been almost invariably as follows. Usual collar incision, dissection of flaps between platysma and underlying muscles, incision up and down between muscles, rarely with transverse cutting, gland exposed. The isthmus is bluntly elevated from trachea, when possible caught with two clamps and cut. The two lobes are immediately begun to be undercut, leaving a thin wedge of gland on either side of the trachea. Then working outward and from the lower pole upward, each lobe is raised from its capsule, the superior vessels easily recognized and by still undercutting and elevating all gland is removed except the wedge-shaped strips along the trachea and a piece of the upper pole, the size of the first joint of the little finger.

At the second or third operation, the wedge-shaped strip and portion of the upper pole have been found much enlarged on one or the other or on both sides, the size of the gland at many primary operations. After separation of the sternothyroid muscles from the front of the trachea and gland, mostly by sharp dissection, the lobes are again undercut from the midline outward and elevated from the lower pole upward and outward to the upper pole, with difficulty on account of adhesions, but in the same way as at the primary operation. We have but one case of postoperative hyperthyroidism and no other particular disturbance in the postoperative course of these thirteen reoperated on cases, in spite of the fact that metabolic rates ranged between plus 42 and 65.

At all operations for adenoma we have inspected, palpated and even incised every portion of the gland left behind for additional smaller adenomata, and in spite of this diligent search have had three cases of growth of an adenoma evidently left behind. In one of these we operated on three times, at each time removing additional adenomata. This was not carcinoma as we first feared and proved not to be by pathologic section and confirmed by the fact that the man is living and in good health eight years since the last operation. These cases of adenoma were not reoperated on because of recurrent masses in the neck but on account of elevation of metabolic rates above plus 30.

It is made clear from the above report and description of operation that the number of cases of both recurrent hyperthyroidism and hypothyroidism have been comparatively few, that the chances of hyperthyroidism are about four to one over hypothyroidism, in spite of the fact that the operation is radical, leaving a minimum quantity of the gland behind. This procedure at first, second and third operation has been safe and has given almost absolute protection to the recurrent laryngeal nerves and parathyroids.

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* Read before the Annual Meeting of American Association for the Study of Goiter, Seattle, Wash., July 10-12, 1930.

Pemberton[1] reported a series of 1,683 patients with exophthalmic goiter operated on at the Mayo Clinic in 1920, 1921 and 1922, out of which number 50 had returned up to September 1, 1929 on account of symptoms that merited further surgical treatment. He described the standard operation of bilateral resection with the removal of the isthmus; an amount of glandular tissue was preserved on either side of the trachea that is equivalent to a sixth to two-thirds of the amount of tissue in a lobe of normal size.

Pemberton[1] argues that, if a function of readjustment were not possessed by the thyroid gland after operation, there would be a far greater number of patients with postoperative myxedema or persistent hypothyroidism; also the high proportion of patients who are entirely and permanently relieved of their symptoms, when a varying amount of thyroid tissue is left, is sufficient clinical evidence to indicate that the remaining portion of the gland regains its power of regulating its function to meet varying demands. He further cites three cases of hypothyroidism and myxedema following subtotal thyroidectomy for exophthalmic goiter, where this condition recurred and in one case a second operation was done.

Whatever the exact amount of gland left behind in resections of the thyroid, it should be the minimum for the sure relief of exophthalmic goiter, but also an amount sufficient to cover and protect the recurrent laryngeal nerves and parathyroids; and with these far more important factors kept firmly in mind, the question of hypothyroidism is not to be considered at the time of the operation.

Gillespie[2] gives the essential literature and reports a group of 209 cases, in which subtotal thyroidectomy had been performed from one to seven years previously. Of this number, twenty-five or approximately 8 per cent, had a definite hypothyroidism or myxedema. In this group the basal metabolism ranged from minus 15 to minus 44.

Comparing our recurrences of hyperthyroidism with those reported by Pemberton and of hypothyroidism reported by Gillespie, one might well conclude that there were other cases in our series not seen or unknown to us and that the fault lay in our lacking of a proper follow up system to bring these cases back. To a certain extent this criticism is true, but considering our policy of insisting on frequent visits by our goiter cases to be sure that they are well and will remain so, their anxiety lest the goiter return and even the calling to our attention on a special visit of the turning of the line of scar a little this way or that way, we believe that we have been kept aware of most real complaints of these patients and we believe that they would return to us.

In exophthalmic goiter, if not likewise in toxic adenoma, there is an intense stimulation of thyroid tissue, altering the tissue itself to a hypertrophy and hyperplasia of the cells, with a decrease of the normal colloid and an oversecretion and altered secretion of these cells.

The occurrence of goiter in our series is about 10 to 1 in the woman. In a paper by Brenizer,[3] the following conclusions were drawn: (1) Cystic, fibrocystic ovaries and ovarian cysts are not infrequently found in association with hyperthyroidism. (2) At puberty, menstruation, the menopause and during pregnancy, the thyroid works parallel with the corpus luteum. When the corpus luteum is adequate, there is little or no enlargement of the thyroid.

During the war we observed a sequence of effort syndrome, shell shock and exophthalmic goiter and fourteen of these cases demanded operation, although our attitude was not to operate on such cases during the period of war activities but to retire them as unfit for further service.

The use of iodine in adolescent goiter, in exophthalmic goiter, in toxic adenoma and as a postoperative protection against regeneration of thyroid tissue and recurrence of hyperthyroidism, is too well known for remarks beyond the comment that iodine is also a two edged blade, frequently arousing nontoxic adenoma to activity and when prolonged bringing about exophthalmic goiter, as we have observed several times in simple adolescent goiter.

Thompson and others,[4] after considering the question of prolonged treatment of exophthalmic goiter in twenty-four cases by iodine alone, for a year or more in thirteen cases, conclude that the patients with moderately severe or severe exophthalmic goiter rarely show more than temporary improvement and frequently the disease becomes more severe, but the mild cases often respond satisfactorily and in some patients it terminates. The response of patients appears to be determined more by what is happening to the disease spontaneously than by the iodine itself. In the cases showing satisfactory results, iodine may have merely held the disease in check, while it was pursuing its natural course. These results in mild exophthalmic goiter are about what we have found to be true both before and after operation. In the severe cases we have found the prolonged use of iodine to make the cases much worse after the initial beneficial effect, and have advised that severe cases not be given iodine until on the way to operation.

The question of infection in exophthalmic goiter has been dealt with by various authors, toxic thyroiditis has been discussed. Brenizer[5] has reviewed the subject of thyroiditis accompanied by hyperthyroidism, with these conclusions: Thyroiditis probably makes up ½ to 1 per cent of all operative material and ¼ to ½ per cent of all observed clinical cases. The two most frequently proven types of inflammation are tuberculous and woody thyroiditis. Syphilitic thyroiditis certainly occurs. Nonspecific thyroiditis has shown its bacterial cause in some suppurating cases. Hyperthyroidism may accompany any type of thyroiditis at any stage, usually the subacute. The relation in tuberculous thyroiditis is striking. Most cases of nonspecific and woody thyroiditis finally become hypothyroid, whether operated on or not. Cases of tuberculous thyroiditis operated on have given the best functional lasting results. Syphilitic thyroiditis has been relieved with appropriate treatment. Therefore, the more slowly progressive and destructive type of inflammation is more apt to be accompanied pathologically by hyperplasia and symptoms of exophthalmic goiter and is more apt to give better functional results after operation. The usual amount of thyroid should likely not be removed, even in tuberculous thyroiditis, for at least one case out of thirteen has resulted in myxedema.

Crile[6] finally resolves exophthalmic goiter into a dual disease of hyperthyroidism and hyperadrenalism, both factors playing necessary roles. The only factors known to him clinically that can precipitate a thyroid crisis are: (a) pain, (b) emotional excitement, (c) foreign proteins, autointoxication, wound secretion, focal infections, infectious diseases, (d) asphyxia, (e) inhalation anesthesia, (f) hemorrhage, and (g) the injection of adrenalin. The common factor in these conditions is adrenalin and, moreover, no other recognized clinical condition causes an increased output of adrenalin.

The prevention of recurrence of exophthalmic goiter can not, therefore, be accomplished by radical removal of the thyroid gland alone, in the presence and persistence of the above factors influencing or exciting thyroid activity. On the other hand, with our present knowledge, the cases of severe recurrence are to be reoperated on as many times as necessary to bring the metabolic rate within normal limits. Repeated thyroidectomies can be accomplished without undue risk to the recurrent laryngeal nerves, the parathyroids and the production of hypothyroidism.

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Studies of Female Genital Hypoplasia. Samuel R. Meeker, Boston (*Journal A. M. A.*, August 16, 1930), asserts that female genital hypoplasia is a common condition and a major factor in the causation of sterility. The immediate cause of such hypoplasia is most commonly a conpubertal insufficiency of the anterior lobe of the pituitary. The diagnosis of established hypoplasia in adult women depends mainly on pelvic examination and the recognition of characteristic stigmas in the uterus. Treatment of established genital hypoplasia is at the present time wholly ineffectual. The diagnosis of incipient or threatened hypoplasia in adolescent girls depends, first, on the recognition of abnormal menstrual behavior, and, secondly, on the identification of depressing constitutional factors, both endocrine and nonendocrine. The treatment of incipient or threatened hypoplasia consists in the elimination of all depressing constitutional factors, and is a hopeful undertaking. In the management of the adolescent cases there exists a new and important opportunity for the practice of preventive gynecology. Both nonendocrine and endocrine abnormalities require to be corrected. The general hygiene of the modern girl leaves much to be desired. Milder grades of anemia are frequent and appear to have a particularly depressing effect on the reproductive system. Chronic focal infection contributes demonstrably to disturbance of the endocrine functions. In occasional cases congenital syphilis, rickets, lesions of the central nervous system, and other disease entities require treatment on the ground of their harmful influence on the metabolic level, as well as on their own merits. The mechanism of endocrine treatment in the adolescent patient is primarily substitution, with an excellent chance of secondary homostimulation. Monoglandular therapy gives better results than pluriglandular; if the primary focus of failure is normalized, responsive disturbances in other glands tend to regulate themselves. The gland required is usually the anterior lobe of the pituitary, occasionally the thyroid, and never the ovary. Success depends on the use of potent preparations in adequate dosage.

# VARIATIONS IN THE NORMAL POSITIONS OF THE PARATHYROIDS*

RAYMUND J. MILLZNER, M.D.
SAN FRANCISCO, CALIF.

The parathyroids were first described by Sandstrom in 1880 and later by Baber in 1881. The importance of these glands was not recognized at the time and they remained almost unknown until rediscovered by Gley in 1890. The physiologic importance of the parathyroids remained in doubt until Gley, followed by Vassale and Generali, proved by animal experimentation that total thyroidectomy produced cachexia strumipriva but not tetany, providing the parathyroids were left intact, but removal of all the parathyroids was invariably followed by fatal tetany. They also showed that the intensity of the tetany varied in an inverse ratio to the amount of parathyroid tissue left.

The parathyroids arise by means of the differentiation of the dorsal diverticula of the third and fourth pharyngeal pouches. The epithelial bodies from these pouches separate early and migrate caudally; those from the third pharyngeal pouch become the inferior parathyroids, those from the fourth pouch, the superior parathyroids.

Normally four parathyroids are present, divided according to their location into a superior and an inferior pair. Supernumerary or accessory parathyroid glands are rather common, and, as might be expected from the relation of the parathyroids to the thymic anlage and the marked migration of the parathyroid anlagen, may be encountered anywhere in the neck and upper thorax. These supernumerary parathyroids are, however, usually quite small and probably play very little part in the prevention of postoperative tetany. Ordinarily the superior parathyroids lie on the posteromedial surface of the thyroid at about the level of the junction of the upper and middle thirds, and adjacent to the anastomotic branches between the superior and inferior thyroid arteries. The inferior parathyroids are less constant in position but usually lie on the lower third of the thyroid gland near the terminal branches of the inferior thyroid artery.

Variations from the usual arrangement are common. These variations are of position rather than number and occur in a fairly constant percentage of cases. In 1927 I[1] reported the result of a study of the location of parathyroids removed during thyroidectomies at the University of California Hospital. This showed that, in approximately 10 per cent of all cases, one or more parathyroids lay on the true anterior capsule of the thyroid gland and that in approximately 30 per cent of all cases one or more lay on either the anterior or the lateral thyroid capsule. These percentages remained constant, regardless of the type or size of the goiter, thus eliminating as a factor in their position, displacement of the parathyroids by an asymmetrical enlargement of the thyroid.

The question naturally arose as to whether these parathyroids which were removed represented accessory glands or whether they were normally located or atypically located parathyroid glands. In 1929 Wellbrock[2] reported the finding of one or more parathyroids on the anterolateral surface in approximately 8 per cent of 1056 thyroid glands examined at the Mayo Clinic. He considered these as accessory rather than atypically placed parathyroids, because of their variable location and the absence of postoperative tetany after their removal. I have always felt that these glands cannot be dismissed as accessory parathyroids because they are typical in size, in shape and in their relationship to the thyroid vessels. The absence of postoperative tetany does not prove these to be accessory parathyroids, as it has been repeatedly shown that tetany does not occur if one or two parathyroids are intact and capable of functioning.

Dissection of autopsy and anatomic material during the last three years has included in forty-two cases a careful search of the thyroid region for parathyroids. This study was undertaken with the primary purpose of determining whether these anteriorly placed parathyroids could be considered as normal variations or whether they represented accessory islands of parathyroid tissue. In this series, on two occasions, we found fewer than four parathyroids. In one case a double or paired structure replaced an inferior parathyroid on one side, evidently arising by a fission of the parathyroid anlage. Fifteen parathyroids were found on the anterior and lateral thyroid capsule and of these four lay on the true anterior capsule. These parathyroids were all typical in size and in relation to the thyroid vessels and capsule, and appeared to represent true anterior displacements. In this series of forty-two cases, therefore, one or more parathyroids lay anterior or lateral in 35.9 per cent and one or more lay on the true anterior thyroid capsule in

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* From the Department of Surgery, University of California Medical School.

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9.5 per cent. These figures approximate very closely those derived from the study of operative specimens.

The importance of preserving parathyroid tissue is self-evident to anyone who has seen a case of severe tetany develop after thyroidectomy. One patient at the[3] University of California Hospital (1925) developed tetany following thyroidectomy and later study of the tissue removed at operation demonstrated three parathyroids on the anterolateral surface of the thyroid gland. This patient was treated by Collip's parathormone and calcium and, although her tetany was kept under control, eventually died a little over a year later of a terminal bronchopneumonia which developed while she was undergoing hospitalization for an attack of tetany. At autopsy a very careful search of the neck structures revealed no tissue recognizable as parathyroid either grossly or microscopically.

Parathyroids may be damaged during thyroidectomy in three ways. (1) They may be, and as has been shown, are frequently removed with the thyroid gland. (2) Necrosis or temporary nonfunction may occur as the result of interference with their blood supply. The parathyroid arteries are unbranched vessels arising from either one of the main branches of the inferior thyroid artery or from one of the anastomotic vessels between the superior and inferior thyroid arteries. Ligation of the thyroid vessels is well borne because of an abundant collateral circulation with the tracheal, esophageal and pharyngeal vessels. Ligation of the parathyroid vessels is almost certain to result in severe damage or even in necrosis, because of the almost entire absence of connecting vessels between the thyroid and the parathyroids through the parathyroid capsule.

(3) Parathyroid injury may easily result from crushing, by the application of hemostats to the thyroid capsule during the course of the thyroidectomy. Many of the transient cases of postoperative tetany undoubtedly result from such damage or from interference with the parathyroid arteries. Recovery in these cases depends upon the regeneration of the damaged parathyroid tissue or on compensatory hypertrophy of the remaining uninjured parathyroids.

A modified technic has been developed at this clinic, under the guidance of Dr. W. I. Terry,[4] in order to obviate parathyroid damage as far as possible. The essential feature of this modified technic is the preservation of the entire lateral thyroid capsule, as well as the posteromedial, by the application of clamps so as to strip the capsule of each lobe from the front backward. A thyroidectomy performed with this technic is really an intracapsular resection.

A second less important feature is the transection of the superior pole by clamps rather than the more usual extracapsular ligation of the superior thyroid vessels. It is interesting to note that, in 1907 Halstead advocated a very similar procedure in order to obviate interference with the blood supply of the parathyroids. Only the anterior capsule is present on specimens removed in this manner. This anterior capsule is easily examined for parathyroids before the resection is begun and, if any are found, special modifications may be instituted for their protection or they may be removed and reimplanted. The adoption of this modified technic has reduced the number of parathyroids removed at this clinic from approximately 35 per cent in 1925 to less than 5 per cent during the past year. This decrease has been paralleled clinically by the smaller number of patients showing even mild evidence of postoperative parathyroid deficiency.

## SUMMARY

1. Parathyroids are present on the anterior surface of the thyroid gland in approximately 10 per cent of all cases and on either the lateral or anterior surface in approximately 30 per cent.

2. These anteriorly and laterally placed parathyroids are not accessory parathyroids but represent normal variations in position.

3. The modification of the standard operation of subtotal thyroidectomy so as to preserve the lateral as well as the posteromedial capsule of the thyroid will preserve the majority of these anteriorly placed parathyroids.

4. Although one or two parathyroids may be removed without permanent evidence of parathyroid deficiency, parathyroid tissue is of extreme value to the patient and should not be unnecessarily removed or damaged.

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# EFFECTS OF THYROID ACTIVITY ON THE FEMALE ORGANISM *

RALPH R. WILSON, M.D.
KANSAS CITY, MO.

The original concept of primacy of the ovary has been enlarged by brilliant researches to include that extensive apparatus designated by Falta[1] as the "hormonopoetic system." This group is dominated by the thyroid-ovary-pituitary triad, with sufficient evidence at hand to consider the thyroid the pace-maker of the lot. "The relation of the thyroid gland to the sex organs is the most ancient and classical interrelation of the functions of the glands of internal secretion" (Marine[2]). The span of woman's sex life is characterized by a series of physiologic epochs, but she remains strikingly feminine throughout, due chiefly to the phenomenal interplay of this endocrine group.

## NORMAL FUNCTIONS

In the embryologic stage the origin and development of both primitive thyroid and primordal generative cells are carefully observed individually (Starling,[3] Keibel and Mall,[4] McIlroy[5]), yet it has been impossible to recognize functional significance prior to removal from intrauterine influences.

Throughout infancy and childhood the proper balance between these systems is manifested most strikingly by the departures from the normal. Absence of the gonad hormone contributes to a characteristic lengthening of the long bones, while these same bones show an excessive shortening in absent or deficient thyroid secretion (Falta, Myers[6]). The period of adolescence has a distinct tendency towards an increase in metabolism and particularly so immediately preceding puberty (Göttche,[7] Dubois[8]). That there is a state of hypersecretion of the thyroid at puberty has been repeatedly observed, being suggested both by enlargement of the gland and increased metabolism, which is considered physiologic with doubtful relationship to later life (Talbot,[9] Janet[10]). During the age range of adult life of the woman, metabolism is obviously affected by certain episodes but the rate of change is essentially uniform (Harris and Benedict[11]).

With the onset of the menstrual epoch there is a significant number of women who show visible thyroid enlargement in the early stage, which Hyman and Kessel[12] consider to be purely physiologic, representing a cyclic hyperplasia rather than a pure hyperemia. In light of the observations to date, it would seem that the individuals with the greatest degree of dysmenorrhea have greatest increases in metabolism, inferring that a factor therein may be irritability and general restlessness from the pain. Even though there is no evidence at hand to show that substituted concentrations of either the whole ovary or follicle extract have appreciable effect upon the metabolism, it is a well known fact that castration in the young adult practically always leads to some degree of hypothyroidism. In later life, however, the artificial menopause seems to cause less diminution in the oxidative processes and of only transient nature (King,[13] King and Patterson[14]). Young women previously presenting suspicious signs of hyperthyroidism have been observed to develop enlargements rapidly during prenuptial engagements (Bram[15]). Graves[16] calls attention to cases presenting swelling of the gland as a result of excessive intercourse which subsided after a period of continence. As to the glandular enlargements of the above types, opinions are still at variance as to whether these individuals are more likely to develop goiter in later life, probably depending considerably upon the efficiency of iodine metabolism.

During normal pregnancy the activity of the thyroid has been mapped out only indefinitely. The early weeks are characterized by a lowered metabolism, which after about the fourth month begins to rise, returning to normal at least by the seventh month. Thereafter it continues to rise until at term it may reach 30 per cent increase, which is attributed to the added protoplasmic mass of the fetus rather than to intoxication (Root and Root,[17] Sandiford and Wheeler[18]). One set of twins was studied by Plass and Yoakum[19] who found the expected rise in metabolism in proportion.

Clinically, the condition of these patients closely reflects the indication of the basal metabolic rate. Coincident with the decreased rate in early gestation is the feeling of profound lassitude; and, as the nausea and vomiting of pregnancy tend toward the pernicious type, the greater the decrease in metabolism. In an occasional instance it requires the keenest diagnostic acumen to differentiate between true hyperemesis gravidarum and an early pregnancy in a thyrotoxic case with marked gastrointestinal symptoms. That the gland itself frequently enlarges during pregnancy is a matter of common knowledge, and the significant observa-

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tion is offered that cases of toxic albuminuria do not show gestational hypertrophy and are frequently hypothyroid (Davis[20]).

Upon expulsion of the fetus, whether at term or premature, the metabolic rate rapidly returns to normal. The period of lactation, however, is characterized by lessened thyroid activity, as indicated by the patient's gain in weight together with a lowered metabolic reading (Sandiford and Wheeler,[21] Plass and Yoakum[22]).

During the menopause and the span thereafter, the thyroid plays a minor role as compared to the child bearing period (O'Keefe[23]), coincident with tendencies toward hypoactivity of most of the remaining endocrine group. Therefore, it is evident in summarizing the life cycle of a normal woman that the degree of thyroid efficiency is directly proportional to its inconspicuousness.

## ABNORMAL FUNCTIONS

For purposes of discussion, which are subject to criticism and offered with no claim for perfection, certain precepts are proposed:

1. Thyroid disease is a continuous series of variegated manifestations, notably subject to spontaneous remissions and a tendency to chronicity (Hertzler,[24] Aschoff[25]).
2. So far as is actually known, the sole function of the thyroid gland is to produce thyroxin which is not a detoxifier.
3. The ideal treatment is prevention, beginning in uterine life.
4. General anesthesia is preferred to local in women when operation is indicated.
5. Goiters are not to be considered "innocent" (Hertzler[26]), particularly in women with menstrual irregularities.

In a gynecologic clinic it has been found necessary to classify abnormal thyroid function rather comprehensively and the following discussion is related to the reproductive phenomena observed in each such group:

### GROUP I. CONGENITAL THYROID DISEASE

1. *Hyperthyroidism in the newborn.* Toxicity is relatively rare, in spite of the rather frequent occurrence of generalized thyroid enlargement at birth, which varies from eleven per cent in a nongoitrous to sixty per cent in recognized goitrous areas (Yoakum[27]). Upon being removed from the intrauterine influences the symptoms usually subside in a few weeks, due to the transiency of the hyperplasia and the total prognosis is good (Diven[28]). The nearer puberty the enlargement persists, the more grave the prognosis, particularly with respect to recurrence in later life. In fact, many showing persistent enlargement before puberty without subsequent exacerbations are probably not true hyperplasias originally. Offspring of the same parents may show goiter with hypothyroidism or with hyperthyroidism (Bram[29]). In those cases manifesting precocious puberty, changes often attributed to the pineal body, the thyroid must come in for consideration, because in such children the association of definitely perceptible enlargement is more than coincident.

2. *Adenomata at birth.* Such cases are rarely reported. Williams mentions their possibility as a cause of dystocia and still-birth. Others die soon after birth, usually from pressure causes in the establishment of respiration, and a remaining few survive surgery. In any event the course is such that no effect upon the reproductive system is recognized and in no way are they to be confused with the histologic group of "fetal adenomata."

3. *Cretinism.* This condition affects the whole reproductive life of the individual. The true cretin is not the menace to society as the modified or milder types which are recognized late in childhood, thereby being deprived of the advantages of thyroid therapy (Sloan[30]). Treatment in any case, for that matter, usually falls short of full anticipation. Nor is prevention always possible, for Talbot[31] has studied the metabolism of a series of mothers of sporadic cretins and found no evidence of thyroid abnormality. It is essential, however, to administer small doses of iodine to every pregnant woman presenting thyroid fullness, inasmuch as it has no effect upon simple gestational hypertrophy. Menstruation in cretinism develops late or not at all, and there may be long periods of amenorrhea. Painful disorders are not so common as oligomenorrhea, frigidity and dyspareunia. There are usually infantile genitalia with the expected low fertility. Pregnancy may occur, and by treatment be carried to full term, but the bony pelvis usually precludes birth by natural channels. Inasmuch as their children are subject to the stigmata of constitutional inferiority, sterilization should be considered in the event of cesarean section. Lactation is scanty. The menopause regularly occurs early and is generally free of associated distress, probably due to the thyroid therapy, as by this time in life most of them realize the bene-

fits of regular dosage. This assumption is justified by reason of the fact that in normal individuals thyroid therapy is beneficial in certain disorders of the menopause (O'Keefe[32]).

### GROUP II. ADOLESCENT OR COLLOID GOITER

Thyroid enlargement during the adolescent period forbodes evil. For years there may be little evidence of activity further than vasomotor instability and short periods of amenorrhea but they surely progress into one of three classes: first, by way of the route of adenoma they advance into toxic states; second, through gradual colloid deposition and the tendency to natural remission, they reach a stage of definite hypoactivity. Furthermore, these two conditions frequently alternate in the same individual, and sometimes overlap so closely that suggestions of both subnormal activity and excessive secretion may be found at the same time, requiring several years study before they can be properly classified. Gardiner-Hill and Smith[33] add the significant observation that the menstrual flow "is often diminished or absent when hyperthyroidism is present, and excessive when thyroid activity is below normal."

The third terminal stage of adolescent goiter may be malignancy which, however, is too rapid in course for appreciable effects upon reproduction.

### GROUP III. THYROTOXICOSIS AND HYPERTHROIDISM

1. Primary thyrotoxicosis exerts vicious influences upon the reproductive system. Onset before puberty, unrelieved, delays this epoch and contributes to amenorrheic tendencies thereafter, an observation emphasized by Basedow in his original contribution. Underdevelopment of the generative tract and "juvenilism" are unusually frequent in individuals quite normal appearing in other respects. In those cases of Graves' disease complaining of menorrhagia and metrorrhagia, nearly always sufficient cause can be found in the generative tract alone. Numerous are the references to the high frequency of associated chronic pelvic and thyroid disease (Hertzler,[34] Bram,[35] W. P. Graves[36]), beginning with Freund as early as 1891 who observed the frequency of uterine fibroids and disturbed thyroid function. In a general way thyroid intoxication affects the reproductive system in a similar way to any prolonged systemic poisoning, manifesting itself according to the particular decade in life at which its onset occurs. On the other hand, there is a small percentage of cases, by some peculiar virtue, to whom excess thyroid secretion is a powerful stimulant for a time, but they eventually exhaust physical limits and their subsequent crash is violent and tragic.

Parturition and thyrotoxicosis are infrequently associated. Fortunately, the higher the degree of toxicity the greater the incidence of sterility but, unfortunately, not sufficiently so as to avoid a large number of abortions and miscarriages. Gardiner-Hill[37] reviews a large series and reports that fifty per cent of the cases in exophthalmic goiter terminate in premature emptying of the uterus in various stages of gestation.

Successful management of these cases depends upon early recognition. The greater the clinical signs of intoxication before pregnancy, the more serious the outlook upon its supervention. The advent of intoxication may be explosive, particularly during the first four months. There is a small percentage of cases who pass through pregnancy and parturition with comparative success without assistance (Mussey et al.,[38] Hyman and Kessel[39]). There are a larger number of cases who do so successfully as a result of diligent care (Falls[40]), but there is another group who meet disaster unless more than conservative methods are adopted. Thyroidectomy during pregnancy is advisable, but not without hesitation and carefully executed preparation (Clute and Daniels[41]). The amount of tissue to be removed under such circumstances is decidedly a problem.

Upon the onset of labor in this condition the following points should govern its conduct:

a. There is a peculiar susceptibility to congestive heart failure.

b. Violent straining with uterine contractions may cause blood extravasation in the thyroid tissues.

c. Postpartum hemorrhage is very frequent, the decreased clotting time being one recognized factor.

d. Their labor is characterized by vigor and violence with subsequent birth-injuries to both mother and child.

In the few instances of primary thyrotoxicosis and pregnancy reaching a crisis, usually sufficient arrest from iodine glucose and sedatives can be secured to permit surgical relief. Even in that event it is probably better to empty the uterus first, inasmuch as thyrotoxicosis is sufficiently difficult to cure under the best of circumstances (Judd[42]). Following the emptying of the uterus thyroidectomy may be postponed weeks or months, due to the removal of pelvic aggravation (Hertzler,[43] Bartlett[44]), permitting observation of a more normal state. In those rare cases resisting arrest from preliminary medication little is to be expected from life-saving procedures of any type. Hertzler[45] has notably stressed the dangers of operations, while the toxicity is on the upgrade. Lactation may be abundant but it is an additional burden to an already sick individual, and toxic milk is questionable food for the infant (Berard and Dunet[46]). Following thyroidectomy, subsequent pregnancies should be avoided for a period of two years at least (Williamson[47]) and, should there be two or more living children, it is wise to advise against future childbearing.

The menopause in this group is passed earlier in life than the average woman and is characterized by short duration and comparative ease. Occasionally there is such improvement thereafter that well-advised thyroidectomy is postponed.

2. Toxic adenoma is more clearly associated with the female reproductive system than primary thyrotoxicosis but less dangerously so, because a small percentage tend to become less toxic after succeeding epochs; and, furthermore, heart complications therein tend toward arrhythmias rather than myocardial weaknesses. They may have extensively nodular goiters, associating specifically certain nodules with puberty or certain pregnancies and yet for several years remain fairly symptom-free. If there is an appreciable degree of subnormal activity, they complain of menorrhagia, metorrhagia, frigidity and often sterility.

Then, there is that group that advances into toxicity, presenting certain analagous situations to primary thyrotoxicosis and yet different in some respects. The intoxication is usually more insidious, giving better opportunities for estimating its severity; so that, in the event of pregnancy, careful observation usually wards off crises. Their power of recovery is generally greater than in the primary type, unless by the years of wear and tear the general body resistance be impaired; and there is less susceptibility to postoperative metabolic storms. Furthermore, Plummer[48] has pointed out their lack of adaptability to iodine therapy. Therefore, should a toxic adenoma associated with pregnancy reach a critical stage, it is logical to attack the goiter first, in contrast to the management of true primary toxic cases. Likewise the danger of recurrence is less from subsequent pregnancies. At the time of delivery, in addition to those dangers peculiar to cases of primary hyperthyroidism, there is the factor of mechanical pressure and anesthetic difficulties.

Lactation is nearly always a failure, resulting in production of abundant body fat and a scarcity of milk fat. The menopause may be imitative of primary toxic types on one hand, or myxedema types on the other, depending upon the activity of the adenomatous gland at that particular decade.

### GROUP IV. HYPOMETABOLISM AND MYXEDEMA

Subnormal activity of the thyroid gland manifests itself in two particular types of cases: those that are classical myxedema and those that are hypothyroid among a group of other symptoms, better known as "polyglandular disturbances."

1. The hypothyroid or hypometabolism (Means[49]) cases are footballs of medicine. In clinics they are shifted from one department to another because of the vagueness of their complaints, and are frequently labelled hypochondriacs. They do not stand pain well, and later in life suffer from headaches frequently (Stevens[50]). Their age of puberty may be within normal limits but their menstrual life is characterized by scanty flow, irregularities and cramps. The breasts are often enormous, with small nipples and areolae. The pelvic organs are practically always juvenile. Marriages are usually sterile, often unhappy because of sexual incompatibility, but some may have small families through duty, before the condition produces absolute sterility (Litzenberg[51]). Their pregnancies and labors are difficult and fraught with complications. They have less tendency to abort than thyrotoxic cases, but their children are oversize. Milk production is small. The menopause often precedes the normal by a full decade, and is featured by menorrhagia and vasomotor disturbances. The span of life is shortened perceptibly; if not by intercurrent infection, to which they are notoriously susceptible, it is by incompetency of the cardiorenal system.

The outstanding features presented in the basal metabolism of these cases is that, although the reading may be only slightly below normal limits, their rates are strikingly consistent on repeated observations.

Marine and Lenhart[52] have pointed out that thyroxin was not the only hormone affecting the basal metabolism; therefore, a combination of extracts is usually more effective than thyroid alone in their treatment.

2. Myxedema usually comes late in the reproductive period of a woman, but its onset may have

a very definite relationship to any epoch in her sex life (Krantz[53]). Comparatively few have an early climacteric, but menorrhagia (Gardiner-Hill[54]) and the associated phenomena of the menopause are severe unless rescued by thyroid therapy. Too often these patients are submitted to pelvic surgery; and likewise, the diagnosis may be confused with pernicious anemia, chronic nephritis or heart disease (Reed and Kennay[55]). In those cases developing true myxedema after an early artificial menopause, it is highly probable that a decreased rate existed before castration.

The treatment of these cases is little less than spectacular. To Schiff[56] goes credit for pioneer work in 1884. In spite of the brilliant researches on thyroxin, the dried extract remains as the most suitable for use (Oswald[57]). Being indicated at an age wherein there is a frequency of cardiorenal disease, the dosage is better started low and increased gradually (Christian[58]). Plummer has made a valuable observation that iodine does not affect thyroid intoxication, resulting from overingestion of the substance. Furthermore, large initial doses seem to depress natural immunity to infection. As yet no one has been able to reduce thyroid therapy to a mathematical formula (Thompson[60]). Clinical observation is a better indication than the basal metabolic rate, and occasionally Reed's[61] formula (B.M.R. 0.683 (P.R.+0.9 P.P.)—71.5) may be used advantageously. In a few cases of myxedema there is an associated albuminuria or even hypertension which does not contraindicate the treatment but indicates caution in its application. Neither obesity nor low metabolic readings per se are indications for thyroid therapy.

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# NECROSIS OF THE HEART AND LIVER IN THYROTOXICOSIS

## WITH SOME NOTES ON THE POSSIBLE CHANGES IN OTHER ORGANS*

William J. Kerr, M.D.
San Francisco, Calif.

Although many writers have suggested that hyperplastic goiter is a general and not a primary thyroid disease, very little evidence of structural change has been found in such cases in other organs than the thyroid. In 1916, Fahr[1] called attention to histologic changes in the heart muscle, consisting of interstitial myocarditis with round-cell infiltration between muscle fibers and around vessels, with fragmentation and destruction of muscle fibers. Goodpasture,[2] in 1921, described two cases of hyperthyroidism with extensive diffuse myocardial necrosis in one case, and focal necrosis in the other. Goodpasture[3] also found slight but definite lesions in the myocardium of rabbits after the administration of large doses of dried thyroid gland and thyroxin. Hashimoto.[4] in 1921, reproduced the lesions described by Fahr after experimental hyperthyroidism in albino rats. Parenchymatous degeneration and round-cell infiltration was found in the liver, heart and other organs.

In September, 1922, the author, with G. Y. Rusk,[5] reported a remarkable case of hyperthyroidism with hyperplastic goiter showing extensive destruction of the liver resembling acute yellow atrophy. After a stormy postoperative course with gastrointestinal symptoms and terminal jaundice, he died on the fifteenth day. The liver was only slightly decreased in size. The surface was roughly granular and of light brownish-red color. On section the normal markings were obscured; the color was reddish-brown and opaque with numerous scattered deeply hemorrhagic blotches, varying in size from mere points up to irregular areas roughly 1 cm. in diameter. After fixation in Jore's solution the tissue showed an irregular green discoloration due to the jaundice, and also tiny translucent gray sports, apparently the center of the lobules, with opaque tissues about the portal regions.

The histologic picture of the liver also was remarkable. The architecture was almost completely lost. The portal regions presented a marked and irregular infiltration with lymphocytes and some plasma cells. No exudate was seen in the bile ducts. Within, but principally just beyond, these lymphatic masses were irregular strands of liver cells separated by irregular groups of deeply pigmented cells, lymphocytes, remnants of necrotic cells, and scattered polymorphonuclear neutrophils and eosinophils. In some areas hemorrhage occurred. A number of cells showed vacuolated cytoplasm; but no definite nuclear damage could be demonstrated. There was no evidence of fibroblastic reaction.

The several sections of heart muscle examined showed but one focus of marked perivascular lymphocytic infiltration, and one small focus of chronic fibrosis. The pancreas showed scattered foci of necrosis interpreted as due to postmortem change (autopsy, two hours after death). The kidneys showed marked parenchymatous degeneration with an occasional small focus of fibrosis and lymphocytic infiltration. The thymus and thyroid showed the usual changes found in hyperplastic goiter. The other organs showed no definite histologic changes.

Since this case was reported, several others have been observed in our clinic where the clinical picture has been quite similar. The course is usually a stormy one, with tachycardia, pyrexia, restlessness, nausea, vomiting, and toward the end in those who died, jaundice and the syndrome of cholemia. In most instances the patients have recovered, but in those who died changes have been found in the liver similar to those described above. Extensive parenchymatous degeneration has also been found in the kidneys, but we have not found extensive necrosis in the heart in any of our cases. In long-standing untreated cases of hyperplastic goiter we have observed extensive fibrosis in the liver which may represent the end-stages of the condition we have described.

In a recent report before the Association of American Physicians Weller[6] reported changes in the liver in the Graves' constitution similar to those we have described, consisting chiefly of round-cell infiltration and fibrosis.

It is not unlikely that further study will show that other organs aside from the liver and heart will show analogous changes. The parenchymatous degeneration of the kidney may be due to the same toxic influence. The pancreas may be similarly affected, giving rise to disturbances in the function of the islands of Langerhans, and resulting in the reduced carbohydrate tolerance seen in some cases. The diabetic state may also be induced by carbohydrate dysfunction in the liver or skeletal muscles. The gain in weight seen in some cases of thyroid hyperplasia may be due to lesions in the ovary or brain. The skeletel muscles may themselves be the seat of structural changes, although in a limited study we have not found confirming evidence. The nuclei at the base of the brain and the sympathetic ganglia may also show histologic changes to explain the mental and neurologic symptoms.

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* From the Department of Medicine, University of California Medical School.

* Read before the Annual Meeting of American Association for the Study of Goiter, Seattle Wash., July 10-12, 1930.

Recent studies on experimental thyrotoxicosis by Andrus,[7] presented before the Society for Clinical Investigation, showed that the glycogen content of skeletal muscle was greatly decreased and the lactic acid content increased. It is of interest that it is in those organs where the glycogen content is normally highest that histologic changes have been most frequently described in this disease.

Further studies are being undertaken to determine the extent of the histologic changes and their possible relationship to disturbances of carbohydrate metabolism.

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Present Status of Nonspecific Therapy. Joseph L. Miller, Chicago (*Journal A. M. A.*, Aug. 16, 1930), asserts that protein therapy has been employed in nearly all acute and chronic diseases of supposed bacterial origin. At present it is used especially in acute polyarthritis, gonorrheal arthritis, the infectious type of chronic arthritis during the period of more or less active inflammation, acute iritis, corneal ulcer, thrombo-argiitis obliterans, bacillary dysentery, dementia paralytica, and multiple sclerosis. Probably the most dramatic results are observed in acute polyarthritis, and it is safe to say this is the only method of treatment that can immediately terminate this disease; at least 50 per cent of patients can be promptly relieved of their discomfort. About one-half of them are cured; the others, after a few days or occasionally a week or more, have a recurrence. In the others the immunity is complete. In the early stages of chronic atrophic arthritis, in which there is marked evidence of inflammation, this treatment will occasionally give gratifying results, terminating the disease, occasionally permanently, more frequently for a few months, after which it again becomes active but will usually yield to a second course of treatment. It is highly improbable that protein therapy is of permanent value in ostearthritis, as mechanical irritation, rather than bacterial infection, is the important etiologic factor. As thrombo-angiitis obliterans is due to an inflammatory reaction, probably of bacterial origin, it offers a field for protein therapy. If this treatment is begun early in the course of the disease, the results may be most gratifying. Not only is its progress stopped, but the patient may show great improvement in his ability to walk without discomfort; in fact, the pain may entirely disappear. In southeastern Europe, protein therapy has been used quite extensively in the treatment of bacillary dysentery and is reported to be much more efficient than the dysentery serum. Miller has used immunized chicken serum, normal chicken serum and immunized sheep serum in the treatment of pneumonia. These serums frequently, but not always, gave a chill. It was noted that when the patient failed to react by a rise in temperature there was no change in the course of the disease. Occasionally, after a violent reaction, the disease would terminate by crisis. The immunized chicken serum, after the fibrin was removed, would no longer cause a marked change in temperature and failed to modify the course of the disease. He thought it might be of interest to determine whether a single small dose of typhoid vaccine intravenously, sufficient to give a moderate reaction, would modify the course of pneumonia. Fifteen patients with lobar pneumonia were so treated within forty-eight hours of the onset of the disease. Three of these, or 20 per cent, had an immediate and lasting crisis with disappearance of all symptoms. The lung, however, failed to undergo resolution until the regular time for the crisis. The greatest interest in protein therapy is now centered in its use in the treatment of dementia paralytica. The number of recoveries reported from malarial treatment varies from 30 to 40 per cent; that is, patients who are able to return to their previous occupations. Multiple sclerosis is another disease in which protein therapy is being used extensively. This new field for nonspecific therapy deserves continued trial. If the treatment is begun early, before irreparable tissue changes have taken place, complete recovery may be possible. It is too early to predict the permanence of the improvement.

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Pharmacology and Medical Schools. Charles W. Edmunds, Ann Arbor, Mich. (*Journal A. M. A.*, Aug. 9, 1930), reviews the status of pharmacology in the curriculum of the medical school and its influence on the practice of medicine. He says : Imagine a physician with a training covering four years, such as is given in a modern medical school, followed by one or two years' internship, receiving a letter from a pharmaceutic firm telling him that "he should refer his medical problems to them." Who are the members of the staff of the firm who shall settle the problems of the physician for him? How reliable and how unbiased will be the therapeutic advice which he will receive? Such a letter is an insult to the profession, but physicians are so used to them that they fail to arouse even a mild state of irritation. The Council on Pharmacy and Chemistry tries to insure that the advertising matter of its accepted products shall contain no incorrect or false information; but who act as critics of the great mass of medical advertising literature which daily floods the mail? And yet it is from such sources that the average physician takes his graduate training in therapeutics. If perchance he is a visiting physician in a hospital or a teacher of medical students, he hands on this commercial therapeutic misinformation with the result indicated in the state board comments which have been quoted. Another effect of this flood of advertising matter which daily clutters the physician's mail, and an effect which is largely overlooked, is the influence which it has on the physician himself. He is trying to the best of his ability to practice scientific medicine and he wants to employ the best and most reliable remedies obtainable. He must therefore try to appraise the value of these remedies by daily experience with them in his practice; but even before he has learned the advantages or drawbacks of one of the hypnotics, let us say, along comes a circular describing another with a different side chain which, it is claimed in a loud tone, gives the compound greatly increased efficiency with lessened toxicity and absence of side effects. What is the physician to do? He must keep abreast of the times, so at the expense of his own independence and of his scientific training he must use the new compound.

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# EDITORIAL

## THIS GOITER ISSUE

The meeting of American Association for the Study of Goiter, which was held in Seattle in July, offered a program of great interest to all students of the goiter problem. It was believed that an issue of this journal, devoted to papers read at that meeting, would prove of interest and value to the readers in the Northwest. Since it was manifestly impossible to present all of the papers in one number, a selection was made of topics which it is considered will aid in solving some of the questions arising in consideration of the goiter problem. This issue, confined to papers dealing with a single type of disease, is presented with the hope that it may provide profitable reading.

## THE NEW PANCREAS

We are pleased to think we have "the goods" on the appendix. Its vagaries have entertained us long enough. Many recall the days in which it wore the mask of peritonitis, intestinal obstruction or the foul collection of pus. These were presented as clinical entities. We know their origin now. Since then we have seen it disguised as ureteral colic with microscopic hematuria or a lumbar ache; it has hung itself from the gallbladder, or in the pelvic cavity has urged the rectum or bladder to conceal its presence. But we know its tricks and are on the lookout.

Will it be the same with the pancreas? With a mortality in the past of 50 per cent, a diagnostic batting average of 10 per cent and a hazy knowledge of causation and terminal forms of its acute infection, are we not at least penetrating the fog and interpreting the language of an organ that has heretofore bewildered us? The deep, boring, often agonizing pain beginning in the epigastrium and extending along the left costal border or through to the back is the sign board to successful investigation. Early shock and urgent vomiting are characteristic in the acute form and the depressed temperature with normal pulse rate should not mislead one. Examination of the abdomen will disclose tenderness in the pancreatic zone and a rough outline of the organ will often be obtained by thumb pressure, working toward the pancreas from the parts beyond. Muscular rigidity is occasionally entirely absent, although a moderate degree of spasticity with increased resistance is the common finding. Rarely is the rigidity of board-like hardness. With biliary disease the tenderness early moves toward the right.

The pathology is interesting. Whereas the acute hemorrhagic or necrotic have been the old familiar forms, we now recognize a subacute stage characterized by edema alone. In certain cases the disease may progress no further, although in others, again like the appendix, it may advance to the acutest degree. Early surgery means early cure in the subacute type and recognition of its presence is vital to avoid the mistake, not uncommon in the past, of closing the abdomen without investigating the region of the lesser sac. A diagnosis of biliary disease has led the surgeon to conclude that an apparently normal biliary tract meant an extra-abdominal source of the pain.

Laboratory tests are almost conclusive in the acute infection. Diastase and amylase are increased in the blood and urine, while later sugar may be increased in the blood and sometimes appear in the urine. In chronic pancreatitis the amylase content of the blood has been increased in a great majority of instances.

Excessive activity of the islands of Langerhans has given us a new disease, "hyperinsulinism." Its manifestations are usually through the central nervous system. Early morning drowsiness or delirious mutterings, going on in some cases to a stage of excitement akin to mania, often send these patients to the psychopathic ward. Quick relief follows the administration of orange juice, toast or other sweets and, per contra, an injection of insulin will precipitate an attack. The low blood sugar proves the diagnosis. A few patients have been subjected to the operation of partial pancreatectomy with encouraging results. Has not the pancreas been long enough a challenge to our diagnostic sagacity and our therapeutic efficacy?

## ESTABLISHED FACTS ABOUT CANCER

During recent years many theories have been offered concerning the cause of malignant disease, some based on scientific facts, others representing fantastic imaginations. Conclusions derived from a careful study of a large collection of clinical cases present information that is trustworthy and of value. When theories are excluded and attention is paid only to established facts, the investigator is in a position to assemble information of commanding importance. Park and LeFevre* have published results of an intensive study of more than 19,000 neoplastic diseases treated at Memorial Hospital, New York City. Especial attention was paid to age, sex distribution and incidence of these cases. The authors have summarized the results of their studies which contain so many important conclusions that it seems worthwhile to quote them in toto.

### SUMMARY

1. During a 12 year period, 19,129 tumors were studied at the Memorial Hospital; of these tumors, 16,565 were malignant.

2. Malignant epithelial tumors comprised 89.6 per cent of this number; 10.4 per cent were sarcomas.

3. The average age of all the patients with carcinomas was 53.9 years. The average age of all the patients with sarcomas was 38.2 years.

4. During the last 75 years, there has been no appreciable change in the average ages of occurrence of the more common malignant neoplasms.

5. The decennium 40 to 50 marks the period where cancer frequency makes its first tremendous increase.

6. Cancers developing in such organs as the breast, thymus, uterus and prostate, which undergo physiologic atrophy at definite periods in the life history of the individual, have specific relationship to age. The majority of the remaining malignant ephithelial tumors are not related to age except that the passing years afford sufficient time for the causative agents to induce degenerations, tissue overgrowth and even cancer.

7. There was evidence to prove that chronologic age is not so important as anatomic and physiologic age as an etiologic factor in cancer.

8. The five most common malignant tumors in infants and children were Wilms' adenomyosarcoma of the kidney, ocular glioma, teratoma testis, endothelial myeloma and thymoma.

9. The age of incidence of certain cancers increase each year until the normal span of human life is reached. These cancers were melanomas, basal-cell epitheliomas, squamous carcinomas of the skin, carcinomas of the lip, penis, floor of mouth, buccal mucosa and inferior alveolus.

10. When percentage corrections are made for the incidence of the various sarcomas on the basis of the proportionate number of persons living during the age periods, it is seen that the incidence of these malignant connective tissue tumors varies only slightly from age 20 to age 80.

11. The benign papillomas of many organs always occur at younger average ages than the carcinomas of the same organ e.g., the age variance of 22 years for the larynx, 17 years for the vulva, 7 years for the urinary bladder.

12. The tumors which occurred predominantly in females were: mammary adenofibroma, lipoma, giant-cell tumor of bone, thyroid adenoma, neurofibroma, carcinomas of the breast, thyroid, urethra, appendix and gallbladder.

13. The tumors which occurred predominantly in males were: chondroma, laryngeal papilloma, papilloma of urinary bladder, thymoma, lymphosarcoma, neurogenic sarcoma, bone sarcoma, multiple myeloma, hypernephroma, squamous carcinoma of skin, basal-cell epithelioma, carcinomas of lip, larynx, tonsil, tongue, buccal mucosa, esophagus, stomach, rectum, liver, pancreas and urinary bladder.

14. There was a constant age difference of 2½ to 4 years for the average age of male and female patients with the same regional and histologic types of cancers; the females were younger than the males.

15. The liability of epidermoid carcinomas of the skin was greater after the age of a century was reached.

16. Thirty per cent of all malignant tumors in patients over 74 years were basal-cell epitheliomas.

17. Brain tumors were uncommon in old people; none occurred in patients over 70 years. Fifty per cent of the gliomas were in subjects younger than 25 years.

18. Chondrosarcoma was the only malignant connective tissue tumor which did not appear in children; the youngest patient was aged 22.

19. Giant-cell tumors of bone were the only bone tumors which occurred with greater frequency in females. Contrary to general opinion, bone sarcomas were relatively as frequent at ages 60 to 64 as at ages 15 to 19 years.

20. The average age of persons with Ewing's endothelial myeloma was 22 years; the average age of persons with multiple myeloma was 42 years.

21. Cancer of the alimentary tract was four times as frequent in men as in women. As the ratio of sex was considered, the major liability of the male to cancer of the alimentary tract seemed uniformly and gradually to approach the female liability from the mouth downward through the digestive tube. Forty-eight per cent of the cancers in males were in the alimentary tract and accessory organs.

22. The adenoid cystic epithelioma of mucous membranes is explained by the Durante-Cohnheim embryonal theory of tumor origin.

23. In subjects younger than 25 years, carcinoma of the tonsil was 13 times as frequent as carcinoma of the tongue.

24. At age 75, carcinoma of the larynx was 32 times as frequent as at age 25. For papillomas of the larynx, the male preponderance was 2 to 1; for carcinomas of the larynx, the male preponderance was 10 to 1.

25. There was evidence to prove the existence of a definite group of carcinomas of the nasal mucosa in children.

26. The average age of patients with carcinoma of the parotid gland was 10 years older than for patients with mixed tumors of the parotid.

27. Carcinoma of the esophagus was very rare in young people. Carcinoma of the stomach was quite infrequent in elderly people.

28. Of all cancers of the gastrointestinal tract, carcinoma of the appendix occurred at the earliest average age, namely 32 years.

29. One of every 25 patients admitted to the hospital had carcinoma of the rectum. Epidermoid carcinoma of

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* Park, G. T. and LeFevre, R. G.: The Age and Sex Distribution and Incidence of Neoplastic Diseases at the Memorial Hospital, New York City. Jour. of Cancer Research, XIV, 2, June, 1930.

the anus occurred at the youngest average age, of all the regional location of this histologic type of cancer.

30. Among 100 regional and histologic varieties of cancer, carcinoma of the prostate gland occurred in patients of the oldest average age, namely 63 years, yet the incidence for this carcinoma did not increase with advancing age.

31. Teratoma testis is essentially a disease of young men; the incidence declined rapidly after age 35.

32. Of all tumors of the female genitalia, vulvar carcinoma occurred in subjects of the oldest average age, namely 60 years. The percentage of vulvar carcinomas occurring in single women was high (16.2 per cent).

33. Carcinoma of the cervix uteri was twice as frequent after age 75 and before age 25. The percentage of carcinomas of the body of the uterus in single women was four times as great as the percentage of carcinomas of the cervix in single women.

34. The ovary was the only organ in the body wherein the benign and malignant epithelial tumors affected subjects of the same approximate age.

35. The incidence of mammary adenofibromas gradually increased from age 20 to age 50. These fibroadenomas occurred in subjects who averaged 15 years younger than the patients with carcinomas of the breast. One of every 7 patients admitted to the hospital had mammary cancer.

36. Thyroid adenomas in males have a greater tendency to become carcinomatous than do the thyroid adenomas in females.

37. Tumors of the sexual organs naturally occurred at younger average ages in single than in married people, e.g., mammary fibroadenoma and intraductal papilloma, sarcoma of the breast, teratoma testis, carcinomas of the penis, prostate, vagina, cervix, ovary and body of uterus.

38. Cancers of early life, as in breast, stomach, tongue and rectum, progress more rapidly, disseminate more frequently and recur more often after removal than do their congeners of adult life. Radiosensitivity is a property found frequently in the malignant neoplasms of youth. Fever is significantly frequent in the case of rapidly-growing malignant tumors in young people.

## OREGON MEETING AT PORTLAND

The fifty-sixth annual meeting of Oregon State Medical Society, which is scheduled for Portland September 17-19, will hold its sessions at the headquarters of the society in the Medical-Dental Building. It is believed this will be one of the best attended and successful meetings in the history of this organization. Reference to the completed program printed below will suggest interesting and profitable subjects to be considered. Special attention is called to the motion pictures whose titles are specified. There will also be instructive scientific exhibits which will add to the attractions of the meeting. Wednesday, the seventeenth, will be devoted chiefly to the golf tournament at Waverly Country Club. It will be noted, however, that the initial numbers on the program are scheduled for that evening. It will be well worthwhile for all able to do so to be present at this meeting.

### PROGRAM

Wednesday, September 17

8:00 a.m. Clinics at various Portland hospitals.

2:00 p.m. Third Annual Medical Golf Tournament. Waverly Country Club.

7:00 p.m. Registration of Delegates and Members.

8:00 p.m. Call to Order by the President, Wilson Johnston, Portland.

8:00 p.m. President's Address, Wilson Johnston, Portland.

8:30 p.m. Special Program on Medical Economics.
Speakers: John H. Graves, San Francisco, Chairman, Committee on Medical Economics, California Medical association.
H. J. Whitacre, Tacoma

Thursday, September 18

7:30 a.m. Breakfast Meeting of House of Delegates, Main Parlor, Portland Hotel.

9:00 a.m. Registration of Delegates and Members continued.

10:00 a.m. Scientific Session.

1. The Nonsurgical Treatment of Piles. A Simple Office Procedure (Lantern Demonstration), Banner R. Brooke, Portland.

Abstract: Exposition of treatment; applicability of various types of cases; complications; contraindications.

2. A Statistical Study of Cancer in Oregon (Lantern Demonstration), J. Earl Else and Harry Watkins, Portland.

Abstract: The deaths reported from cancer in Oregon between 1919 and 1928 inclusive are studied and grouped according to age, sex and organ involved.

3. Concerning Myringitis Bullosa, E. V. Ullman, Corvallis.

Abstract: Description of clinical signs and symptoms; nonrecognition of this disease as a morbus sui generis; frequent dismissal of patients with partially defective hearing; desirability of avoiding paracentesis; etiology of the disease; description of experiments by the author in cooperation with R. Kraus; discussion of two cases in which this disease was followed by facial paralysis.

4. The Abdominal Symptoms of Radiculitis (Lantern Demonstration), Wesley E. Gatewood, Portland.

Abstract: Just as tabetic crises may simulate gastric ulcer, radiculitis may suggest to the physician or the patient appendicitis, gallbladder disease, colitis and pancreatitis. Pain, hyperesthesia and tenderness of segmental distribution are the chief symptoms of radiculitis and pain in some form is the most prominent symptom of abdominal visceral disease. Usually the pain of visceral disease is interpreted and localized by the sensations referred through the somatic nerves to the portion of the wall overlying. A careful analysis of the pain and sufficient investigation to reveal the factors which influence it will usually distinguish between these two conditions.

5. A New Apparatus for Sinus Roentography (Lantern Demonstration), W. W. Baum, Salem.

2:00 p.m.

1. Surgery of the Sympathetic Nervous System (Lantern Demonstration), Paul G. Flothow, Seattle.

Abstract. Brief resume of the anatomy of the sympathetic nervous system; brief resume of the physiology of the sympathetic nervous system bearing on its surgical application in various conditions; application of sympathetic surgery to chronic arthritis; technic of operations; conclusions.

2. Ten Years Experience with Morphine Scopolamine or Pantopon Scopolamine (Lantern Demonstration), Grant S. Beardsley, Eugene.

3. A Modification of the Ascheim-Zondez Pregnancy Test with Findings in 150 Cases (Lantern Demonstration), Albert Mathieu and Thomas McKenzie, Portland.

Abstract: The Ascheim-Zondez pregnancy test is based upon the presence of anterior pituitary hormone in the urine of pregnant women; full detail of the technic for carrying out the test, and interpretation of finding will be given; analysis of 150 tests; attention is directed to the scientific exhibit, showing results of tests applied to rats.

4. Congenital Obstruction of the Posterior Urethra in Children (Lantern Demonstration), Charles D. Donahue, Eugene.

Abstract: Review of different types of obstruction; report of a submucous fibrosis of the bladder outlet in a boy aged 8; treatment of such a case.

5. Pulmonary Tuberculosis (Lantern Demonstration), Marr Bisaillon, Portland.

6. Epituberculosis. Report of Two Cases with Review of Literature (Lantern Demonstration), S. G. Henricke, Portland.

Abstract: Review of literature from 1896 to the present time; discussion of various terms applied to this condition and the theories of its pathogenesis; description of this onset, symptomatology, differential diagnosis and treatment; presentation of two illustrative cases; discussion of possible relationship of erythema nodosum and tuberculosis in general and to tuberculosis pleurisy in particular.

8:00 p.m. Motion Picture Program, Society Auditorium.

1. Prolapse of the Uterus in Elderly Women (one reel), Raymond E. Watkins, Portland.

2. Movements of the Alimentary Tract in Experimental Animals (one reel), A. J. Carlson and A. B. Luckhardt, University of Chicago.

3. Influence of Drugs on Gastrointestinal Activity (one reel), H. B. Kellogg and L. W. Dowd, Northwestern University, Chicago.

4. Anatomy of the Abdominal Wall (one reel), H. B. Kellogg and William C. Windle, Northwestern University, Chicago.

5. Colle's Fracture (one reel).

The last four films will be shown by Dr. E. G. Smith, representing the Petrolagar Laboratories, Inc., Chicago.

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Friday, September 19

7:30 a.m. Breakfast Meeting of House of Delegates, Main Parlor, Portland Hotel.

9.00 a.m. Scientific Session.

1. Experimental Focal Infection in Relation to Cardiac Pathology (Lantern Demonstration), Noble Wiley Jones and S. J. Newsom, Portland.

Abstract: The report details the steps taken in the attempt to demonstrate a causal relationship between experimentally produced chronic focal dental infection and pathologic changes in the heart of the dog. Parenchymatous degeneration of the myocardium and a gross hypertrophy of about 15 per cent were produced.

2. Recent Contributions to the Study of Intestinal Obstruction (Lantern Demonstration), G. E. Burget, Portland.

Abstract: The clinical condition as seen in obstruction in the small intestine involving a section of gut is contrasted with the experimental obstruction consisting of making a closed loop and reestablishing the continuity of the gastrointestinal tract. This difference is brought out by attaching the loop to the peritoneum of the abdominal wall where it can be aspirated and the intraloop pressure kept down. Such animals live indefinitely without showing any noteworthy changes in blood chemistry. Wangensteen has shown that the material in the gut above obstruction is no more toxic than the content of normal small intestine when injected intravenously. By injecting the vomited fluids into the gastrointestinal tract below the obstruction White and Fender kept their animals for weeks. Dragstedt has shown that loss of gastric juice alone will result in death in five to eight days. Injected chlorides tend to restore the lost fluid and chlorides in obstruction but the evidence that chlorides act by detoxifying (Haden and Orr) is lacking.

3. Uterine Adenomyoma, a Clinical and Pathologic Study (Lantern Demonstration), Warren C. Hunter and John C. Adams, Portland.

Abstract: Lack of appreciation of the importance and comparative frequency of adenomyoma of the uterus; this condition not infrequently obscured by presence of concomitant discrete fibromyomata in the uterus or changes in the adnexa, but in series under discussion fifty per cent of the uteri show uncomplicated diffuse adenomyoma; frequency of severe dysmenorrhea in patients with this form and its erroneous assignment to some other cause such as fibroids or endocrine dysfunction; likelihood of establishing correct diagnosis by accurate history and pelvic examination, together with negative pathologic findings on curettage.

4. Bronchogenic Carcinoma of the Lung. A Clinical and Pathologic Study (Lantern Demonstration), Frank R. Menne, Marr Bisaillon and Thomas R. Robertson, Portland.

Abstract. A study of fifteen instances of primary bronchogenic carcinoma is presented. A consideration of the clinical history, physical and roentgenologic findings, the clinical course, the differential diagnosis and pathology. In connection with the clinical course it is pointed out that there is an abruptness of onset with a variable character and multitudinous manifestations in the symptomatology. The physical findings have to do with the disturbances that may be elicited from bronchial obstruction and associated with inflammatory process in the lungs. Emphasis on the roentgenologic examination, namely bronchial obstruction, atelectasis and other phenomena. The clinical course is found to be progressive, of variable duration (in our experience an average of six months). The length of the illness from bronchogenic carcinoma depends in a large measure upon the associated pathology and the metastatic involvement. In the differential diagnosis there must be considered pulmonary tuberculosis, lung abscess, mediastinal neoplasis, primary pulmonary Hodgkin's and penumonia. The consideration of the pathology deals with the pathogenesis, the location and types according to the gross and microscopic findings.

5. Perinephritic Abscess (Lantern Demonstration), John G. Cheetham, Portland.

Abstract. A study of the clinical features of this disease with special attention to etiology, differential diagnosis, treatment prognosis; presentation of statistical reports and data from personal cases.

6. Nutritional Allergy in Children (Lantern Demonstration), C. Ulysses Moore and Helen G. Dennis, Portland.

Abstract. Conditions referable to food allergy and their symptoms; diagnosis; skin tests, scratch and intradermal; elimination diets; treatment; case reports.

12:30 p.m. Luncheon Meeting of Oregon Public Health League, Main Parlor, Portland Hotel.

2:00 p.m. Business Session and Election of Officers.

2:30 p.m. Scientific Session.

1. The Relationship of X-Ray Appearances to Ultimate Function in Fractures (Lantern Demonstration), Richard B. Dillehunt, Portland.

Abstract. Discussion of the relationship between radiographic appearances in fractures and ultimate functional and cosmetic results and the importance of a new basis of use of radiographic evidences in medicolegal work.

2. A Study of Wound Healing Following the Employment of Various Suture Methods in Gastrointestinal Anastomosis (Lantern Demonstration), Karl H. Martzloff, Portland.

Abstract. Study based upon experiments performed on about fifty dogs, on whom gastroenterostomies were performed. Various types of suture methods that are described in our textbooks on surgery were employed. The animals were sacrificed at various times after operation and histologic study revealed marked differences in healing, dependent upon the type of suture method employed. Other complications such as mucosal inclusions were also observed after certain types of operative procedures. It is conjectural whether some of these observations may have some bearing upon the problem of jejunal ulceration.

3. A Study of the Clinical and Pathologic Criteria Differentiating Ulcerating Carcinoma of the Stomach from Carcinoma on Ulcer and Chronic Gastric Ulcer (Lantern Demonstration), W. H. Bueermann, Portland.

4. The Prevention of Postoperative Complications in Oral Operations (Lantern Demonstration), Joseph A. Pettit, Portland.

5. Troublesome Problems in Cleft Lip and Cleft Palate Surgery (Lantern Demonstration), C. W. Brunkow, Portland.

Abstract. Discussion of preoperative complications, including malnutrition, upper respiratory infections, mandibular joint dysfunction, dental caries and misplaced teeth, previous operations, misplaced tissues and chest complications; discussion of operative difficulties, including the anesthesia problems and surgical team-work, multiple state plastic repair, the pedicle flap method of closing the palate and the suprapalatine rubber dam method; discussion of postoperative difficulties, including interference of tongue with union of suture line, nonunion due to infection and tension, delayed hemorrhage, keloid tendency, self-inflicted injury after repair, and lack of proper speech training following repair; presentation of means used in dealing with the preoperative, operative and postoperative difficulties as enumerated.

7:00 p.m. Annual Banquet, Main Dining Room, Portland Hotel. Auspices of Portland City and County Medical Society.

## ANNOUNCEMENT OF NEW JOURNAL

A new medical journal, entitled *The Western Journal of Surgery*, will publish its first issue this month, appearing from Portland. Dr. Goodrich C. Schauffler of that city will be the editor. As indicated in its title, this journal will be devoted to the interests of surgery and surgeons of the Pacific Coast. The prospectus states that its promoters aim to serve in unifying the surgical interests of the western coast by publication of suitable papers, discussions, reports of surgical meetings and allied gatherings. They believe that a field exists for a special journal of this character, modeled after similar publications emanating from eastern sections of the country. Our felicitations are extended to the new publication with the hope that it may prosper and prove of benefit to the profession of this coast.

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## MEDICAL NOTES

Note Advertiser's Offer. Attention is called to the advertisement of Maltbie Chemical Company on first cover page, where it is stated complimentary packages of calcreose and ephedrine will be sent to all applicants.

Goiter Prize Award. At the recent meeting of the American Association for the Study of Goiter at Seattle, Washington, Dr. William F. Rienhoff, Jr., of Johns Hopkins University, Baltimore, Maryland, received the annual award of $300 for the best essay dealing with the goiter problem. Drs. O. P. Kimball, of Cleveland, Ohio, and E. P. and D. R. McCullagh, Cleveland Clinic Foundation, Cleveland, Ohio, and Robert P. Ball, of the University of Louisville, received honorable mention.

Program of International Medical Assembly. The annual meeting of Inter-State Postgraduate Medical Association of North America, which will met in Minneapolis October 20-24, presents a program of astounding amplitude, covering a large part of general practice and the specialties. Anyone who can find it possible to attend this meeting will be well repaid by the wealth of material presented by the leading members of the profession in this country. This statement is emphasized by the following enumeration of the men who will appear on the program.

Diagnostic clinics will be presented by Hugh Cabot, Samuel J. Kopetzky, Alfred T. Bazin, John Polak, Donald C. Balfour, Henry A. Christian, William D. Haggard, Edward W. Ochsner, William E. Lower, Carl A. Hedblom, William F. Braasch, Harlow H. Brooks, Alan G. Brown, Dallas B. Phemister, William C. Quinby, Irvin Abell, Isaac A. Abt, Charles H. Mayo, Elliott P. Joslin, John B. Deaver, Fritz B. Talbot, Nathaniel Allison, Dean D. Lewis, John F. Erdmann, Burton J. Lee, Elsworth S. Smith, Frank H. Lahey, Emanuel Libman, Walter E. Dandy, Charles A. Elliott, Alfred W. Adson, George E. Brown, John H. Musser, E. Starr Judd, Russeli L. Haden, David P. Barr, George W. Crile, Leonard G. Rountree, Arthur D. Bevan, Henry S. Plummer.

Addresses will be made by Otto H. Schwartz, Edmund B. Piper, John W. Williams, P. Brooke Bland, William B. Henry, Henry A. Christian, Robert D. Rudolf, William B. Castle, Fielding O. Lewis, Samuel J. Kopetzky, William V. Mullen, Harris P. Mosher, Arnold Schwyzer, Alfred T. Bazin, John O. Polak, George H. Ryder, Dallas B. Phemister, William C. Quinby, William E. Lower, William F. Braasch, Robert C. Coffey, Henry Wade, Alvah H. Gordon, Carl A. Hedblom, Edward W. Ochsner, Hugh Cabot, Harlow H. Brooks, Donald C. Balfour, Irvin Abell, T. Wingate Todd, Bernard H. Nichols, William D. Haggard, Frank E. Burch, John B. Deaver, A. H. M. J. Van Rooy, William A. White, Charles L .Scudder, Paul B. Magnuson, Fraser B. Gurd, Dean D. Lewis, Charles H. Mayo, Elliott P. Joslin, Isaac A. Abt, Alan G. Brown, Fritz B. Talbot, Nathaniel Allison, Edwin W. Ryerson, William G. Turner, George E. Bennett, Russell L. Haden, Howard Fox, James M. Martin, Emanuel Libman, Elsworth S. Smith, George W. Holmes, Charles S. Williamson, John H. Musser, Burton J. Lee, Frederick N. G. Starr, John F. Erdmann, Joseph E. Sheehan, John W. Martin, Jean S. Millard, Cassius H. Watson, Roy D. McClure, Loyal A. Shoudy, Alfred W. Adson, Walter E. Dandy, William J. Mayo, Charles A. Elliott, Frank H. Lahey, Stewart R. Roberts, Henry S. Plummer, George W. Crile, Arthur D. Bevan, David P. Barr, William J. Kerr, Leonard G. Rountree, E. Starr Judd and Andrew C. Ivy.

## OREGON

**Rod and Serpent.** This is the title of the official bulletin of Oregon State Medical Society and affiliated organizations, the first issue of which has been received. The publication presents a handsome appearance and contains material pertaining to activities of the state society, the state board of medical examiners, medical school library and personal references. In size it surpasses the ordinary society bulletin. The contents show careful editing, with much information of value to members of the society. The organization is to be congratulated on the inauguration of such an attractive and ambitious publication.

**New Hospital Superintendent.** Mrs. Bessie Rumley has been appointed superintendent of the Protestant hospital at Baker, where she has been a nurse for the past six months. She succeeds Mrs. Emma H. Gragg who has moved to Portland.

**Ordered to the Presidio.** Major Herbert C. Mallory of United States medical corps, who has been located for several years at Portland, has been ordered to the Presidio, San Francisco. He has been instructor of the medical units in the second reserve area, comprising Oregon, Washington and Alaska. In his work he has supervised the medical corps officers. The reserve corps medical school in Portland since 1927 has increased from sixty-nine to two hundred fifty members.

**Conviction of Illegal Practitioners.** During the first six months of this year, the State Board of Medical Examiners investigated eighty-one cases involving violation of the medical practice act. Three cases carried to the courts resulted in conviction of practicing without a license. These were Anthony J. Corbett of the Dean Rectal and Colon Clinic in Portland, J. A. Smith of Klamath Falls and W. H. Rockwell of Burns, all of whom were fined for their violation of the law.

**Membership in the State Society.** On July first membership in the State Medical Society was 730, an increase of over forty per cent during the past four years. This increase is indicative of the interest of physicians of the state in the activities of the society.

**Licenses Granted.** At the meeting of the board of examiners in June, twenty-six applicants were granted licenses for practice. Eighteen licenses were granted by reciprocity.

**Dr. Milton V. Walker** has located for practice at Powers. He has taken the place of Dr. Nelson W. Mercier who has moved to Montana. Dr. Walker was formerly connected for a number of years with the Henry Ford hospital in Detroit.

**Dr. Paul A. Pemberton** has located for practice at Woodburn. After graduating from the University of Oregon Medical School he spent a year as intern at Multnomah county hospital.

**Portland City and County Medical Society** held a summer meeting July 16. Dr. Oliver P. Kimball of Western Reserve University School of Medicine delivered an address on the progress of goiter prevalence.

**Dr. J. V. Wilhelm**, who has practiced at Condon, has located in Arlington where he has also purchased a pharmacy.

## WASHINGTON

**Licentiates of the Examining Board.** The semiannual meeting of the medical examining board was held in Seattle in July. Twenty-four applicants received licenses from examination, while twenty-six were licensed by reciprocity. All applicants received grades of at least 60 per cent in each subject, as required by law. Their names appear in the following lists.

### LICENSED BY EXAMINATION

Beattie, J. F., Univ. of Oregon, Aberdeen
Bellas, N. M., Univ. of Manitoba, Wenatchee.
Carpenter, R. V., Englewood, Colo.
Clayton, I. S., Univ. of Illinois, Seattle.
Dalton, R. E., Washington Univ., St. Louis, Spokane.
Dempsay, G. R., McGill, Montreal, Seattle.
Drummond, C. I., Univ. of Nebraska, Seattle.
Eaton, C. M., McGill, Montreal, Seattle.
Ferrell, L. J., Rush Medical College, Everett.
Flaherty, Richard, Marquette Univ., Spokane.
Foster, R. F., Northwestern Univ., Seattle.
Granat, Henry, Univ. of Manitoba, Vancouver, B. C.
Hartung, F. H., Univ. of Nevada, Seattle.
Hauschel, R. J., Northwestern Univ., Seattle.
Heitman, M. M., Rush Medical College, Sand Point, Ida.
Hetherington, L. P., Univ. of Nebraska, Seattle.
Langley, C. S., Royal Coll. of Phys. and Surg., Edinburg, Seattle.
Larson, H. V., Univ. of Nebraska, Seattle.
Malzacher, J. W., Univ. of Nebraska, Seattle.
McKibbin, W. B., Northwestern Univ., Seattle.
Newsom, Bryan, Northwestern Univ., Munday, Tex.
Page, S. R., Univ. of Oregon, Seattle.
Parmelee, E. B., Northwestern Univ., Seattle.
Stevens, G. E., Longview.

### LICENSED BY RECIPROCITY

Abraham, J. T., Washington Univ., St. Louis, Wenatchee.
Adams, A. O., Washington Univ., St. Louis, Spokane.
Barber, T. M., Univ. of Nebraska, Medical Lake.
Bunten, J. C., Northwestern Univ., Augusta, Kan.
Churney, O. L., Wash. Univ., St. Louis, Oakland, Calif.
Cameron, W. C., Univ. of Pennsylvania, Tacoma.
Clarke, T. C., Northwestern Univ., Milwaukee, Wis.
Duncan, G. R., Univ. of Minnesota, St. Paul, Minn.
Goering, W. H., Univ. of Iowa, Tacoma.
Hill, T. P., Rush Medical College, Ventura, Calif.
Joldersma, R. D., Univ. of Michigan, Bremerton.
Kahala, A. A., Univ. of Minnesota, Crookston, Minn.
Lewis, C. H., College of Med. Evangelists, Tacoma.
McArthur, R. J., Univ. of Oregon, Portland, Ore.
Metheny, David, Univ. of Pa., Rochester, Minn.
Muir, E. C., Univ. of Minnesota, Minneapolis, Minn.
Nunn, L. L., Jefferson Med. Col., Rochester, Minn.
Seelye, W. B., Harvard Medical School, Seattle.
Shaw, J. W., Univ. of Michigan, Ann Arbor, Mich.
Smitgen, P. H., Rush Medical College, Los Angeles, Cal.
Southcombe, R. H., Univ. of Michigan, Medical Lake.
Tupper, W. E., Rush Medical College, Laurel, Mont.
Warren, E. D., Univ. of Oregon, Westfir, Ore.
Welsh, C. L., Tulane Univ., Aberdeen.
Williams, L. E., Univ. of Minnesota, Oak Terrace, Minn.
Smith, C. L., Univ. of Nebraska, Seattle.

**Free from Typhoid Fever.** According to public health figures recently published, Spokane led all important western cities in absence of typhoid fever in 1929. During that year it had no fatal case of this disease, compared with its rate of 50.3 per 100,000 population twenty years ago, when this city led all western cities in the typhoid death rate. The pure water supply is assigned as the chief reason for the present exemption.

MEDICAL EDUCATION CAMPAIGN. Pierce County Medical Society has been active in recent months in a campaign of newspaper publicity on public health problems. Members of the society who have participated in this work have been gratified at the receipt of inquiries from many sections of the country regarding methods of conducting this campaign. The purpose is to impart information relative to prophylaxis rather than treatment of disease.

NEW HEALTH OFFICER APPOINTED. Dr. Lloyd Moffit has been appointed Yakima city and county health officer to succeed Dr. Henry Storgaard, who recently resigned from that office. For several years Dr. Moffit has been county physician and coroner.

COMMISSIONED MEDICAL DIRECTOR. Dr. L. D. Fricks, head of the United States Public Health Service in Seattle, has been commissioned by President Hoover as medical director. He has been at the head of the Sixth District with headquarters in Seattle for the past three years.

NEW HEALTH OFFICER TO BE APPOINTED. Dr. J. W. McDowell, of Seattle, was last month appointed as city-county health officer of Bellingham and Whatcom county. Without actually assuming the work of this position he resigned the appointment. The county commissioners at this writing have not decided on a successor.

VISIT FROM AUSTRALIAN SURGEON. Dr. N. D. Royle, of Sydney, Australia, was a visitor in Seattle last month on his way to the meeting of the British Medical Association at Winnipeg. On August 16, at a special meeting of King County Medical Society, he delivered an address on "The Sympathetic Nervous System and Muscle Tone." At a dinner of Seattle Surgical Society he read a paper on "Sympathectomy for Certain Diseases of the Kidneys."

DR. H. J. WARNER, federal medical director, with headquarters at Albuquerque, N. M., has been appointed to take charge of the Second District, comprising seven Northwestern states, with heaquarters at Spokane, where he will be located. He will succeed the late Dr. David C. Turnipseed. He will be in charge of Indian supervision over this district.

DR. ROBERT F. FOSTER, of Colfax has located for practice in that town in association with Dr. E. N. Layton. He is a graduate of Northwestern University and recently has served as intern in a Chicago as well as a Seattle City hospital.

DR. HARRY GILBERT, who has recently served as intern in Swedish hospital, Seattle, has located for practice at Cle Elum.

DR. JOHN T. ABRAHAM, a graduate of Oregon Medical School, who has recently studied in New York City, has located for practice at Wenatchee.

DR. ALVIN M. OSTEN, graduate of Northwestern University, has located for practice in Seattle after serving as intern in the Swedish hospital.

DR. H. M. WISWALL of Vancouver, who has recently graduated in medicine, has entered into partnership with his father, Dr. R. D. Wiswall.

DR. E. B. PARMLEE, formerly of Spokane, has located for practice in Seattle. He graduated from the Northwestern University Medical School after graduating from the University of Nebraska. He served as assistant bacteriologist in that state.

DR. WAYNE W. C. SIMS has located for practice at Bellevue to succeed Dr. A. W. Brennan, who has retired due to ill health after practicing for some time in that city.

DR. JOHN L. HARRIS, who has practiced for some time at Spokane, moved last month to Stevenson where he will engage in general practice.

DR. G. R. DUNCAN of St. Paul, Minn., has located for practice at Kennewick. He was for five years engaged in tuberculosis work in Hennipen county.

## IDAHO

NURSES ON STRIKE. Recently there has been much disturbance in Pocatello General hospital in consequence of a strike on the part of the nurses in opposition to the alleged domineering rule of the superintendent. Numerous meetings were held at which different doctors gave their views regarding the controversy. The cause seemed to center about excessive discipline of the nurses, all agreeing that the institution was managed efficiently and in an up-to-date manner.

## OBITUARIES

DR. HARRY C. ROBINSON of Nampa, Idaho, died August 20 from disease of the heart, aged 67 years. He was born at Amelia, Ohio, in 1863. He graduated from University of Cincinnati Medical College in 1893. He practiced in Cincinnati for twenty years. He moved to a ranch near Nampa where he lived for two years. He located for practice at Nampa in 1913. For more than ten years he was a member of the school board, of which he was chairman.

DR. CASSIUS M. C. BUCHANAN died at Burley, Ida., July 26, aged 70 years, after several weeks illness. He was born at Moscow, Ohio, in 1860. He graduated from Ohio State Medical College at Cincinnati in 1880. He practiced in Easton, Ill., for nearly twenty-five years and located at Burley in 1918, where he practiced until the time of his death.

DR. ALBERT ROGERS died at Seabeck, Wash., August 2, after a short illness, aged 62 years. He was a graduate of Starling Medical College, Columbus, Ohio, in 1885. He formerly practiced at Okanogan and Lopez. He moved to Seabeck twelve years ago, where he retired from practice and engaged in farming.

DR. JAMES L. SCRIPTURE died at the Veterans' hospital, Portland, Ore., July 30, aged 60 years. He was born in Iowa in 1870, and graduated from the medical department of University of Iowa in 1897. In 1917 he enlisted as captain in the medical corps. He joined the United States Veterans' Bureau in 1892.

INTRAUTERINE TRANSMISSION OF TYPHOID. Elihu S. Wing and Daniel V. Troppoli, Providence, R. I. (*Journal A. M. A.*, Aug. 9, 1930), report the case of a mother convalescing from typhoid who gave birth to a convalescent baby with positive stools and positive Widal reaction. They believe that this case gives additional weight to the theory that the fetus produces its own agglutinins.

# BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

The Beginnings; Egypt and Assyria. By Warren F. Dawson, F.R.S.E., Fellow of the Royal Society of Medicine, etc. 86 pp. $1.50. Paul B. Hoeber, Inc., New York, 1930.

Medicine in the British Isles. By Sir D'Arcy Power, K.B.E., F.R.C.S. (Eng.), Honorary Librarian to the Royal College of Surgeons (Eng.), etc. 84 pp. $1.50. Paul B. Hoeber, Inc., New York, 1930.

Anatomy. By George W. Corner, M.D., Professor of Anatomy of Rochester. Illustrated. 82 pp. $1.50. Paul B. Hoeber, Inc., New York, 1930.

These little volumes are included in a series of handbooks under the general title, "Cleo Medica." They aim in a consistent, readable form to present special phases of the complex history that underlies modern medical science.

The earliest medical documents in the world have come down from Egypt and Assyria. The custom of embalming the dead profoundly influenced medical knowledge as it afforded opportunities of obtaining information concerning the internal structure of the body. The magician figured prominently in the treatment and cure of diseases. Their methods of procedure dealt extensively with magic and mystery. There are many papyri which afford interesting accounts of Egyptian medicine. While their knowledge of gross anatomy was fairly accurate, they failed to understand nerves, muscles, arteries and veins. Considerable knowledge is obtainable concerning Assyrian medicine. There is much similiarity between the Egyptian and Assyrian medical texts. Their prescriptions for treating specific diseases contain many grotesque and absurd directions, suggestive of some of the procedures recorded in early Colonial medicine in this country. Perusal of this volume will fascinate one interested in the beginnings of medicine.

There is no knowledge of medical practice of the British Isles until some years after the Norman conquest of England. One impediment to medical practice was the fact that failure to cure often resulted in a fine and if the patient died the surgeon in attendance might also be killed. Therefore, the custom was to treat only curable cases. Until about the fifteenth century the barbers and surgeons were leading practitioners, but the College of Physicians obtained a charter in 1518 which has continued to the present time. The barbers were not separated from the surgeons for several centuries after this. In 1800 the College of Surgeons was founded as it exists today. From the earliest times internal medicine was practiced separately from surgery. Obstetrics was long in the hands of midwives, a doctor being called only in case of necessity. The other specialties were early established as more knowledge of medicine prevailed. The earliest hospitals were organized under ecclesiastical authority, St. Bartholomew's being founded in 1123. This volume has chapters on medical societies dating back several centuries. There is also a chapter on masters of British medicine, listing some of the best known medical lights of the past.

The history of anatomy began with the work of the early Greeks, dating back 500 B.C. to the Hippocratic collection. The fame of Galen stands out most conspicuously as the great teacher of anatomy. His great difficulty was his ignorance of the circulation of the blood. He established an anatomic basis for the distribution of natural, vital and animal spirits. During the Moslem supremacy in Europe, science made no progress and scarcely existed. During the fourteenth and fifteenth centuries human dissection began to acquire recognition. Then came the work of Vesalius, the outstanding anatomist of the sixteenth century. Modern anatomists followed after this period with many notable discoveries and writings on the part of the French and German anatomists. This monograph develops the knowledge of histology, embryology, neurology and current trends in anatomy.

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Diseases of the Eye, for Students and General Practitioners. By Charles H. May, M.D., Director of Eye Service, Bellevue Hospital, New York, etc. Thirteenth Edition, Revised. With 374 Original Illustrations, Including 23 Plates, with 73 Colored Figures. 461 pp. $4.00. Wm. Wood & Co., New York, 1930.

The author has presented a concise, practical, systematic manual of diseases of the eye, intended for the student and general practitioner of medicine. Space, therefore, has been allotted as the necessities of such readers require. Thus, rare conditions have merely been mentioned; uncommon affections, of interest chiefly to the specialist, have been dismissed with a few lines; and common diseases have been described with comparative fullness. A part of one of the chapters has been devoted to the slit-lamp and corneal microscope, this instrument having proved its value in clinical examination. In bringing this volume up to date, it has not been increased much in size, the original plan of presenting a book for the student and general practitioner having been adhered to. Patrick.

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The Long Trek. Around the World with Camera and Rifle. By Richard L. Sutton, M.D., Sc.D., LL.D., F.R.S. (Edin.), Fellow of the Royal Geographical Society, etc., and Richard L. Sutton, Jr., A.M., B.Sc., M.D., Fellow of the Royal Geographical Society. With more than Two Hundred Illustrations from Photographs made by the Author. 374 pp. $5.00. The C. V. Mosby Company, St. Louis, 1930.

This is an interesting description of travels and hunting through a section of Eastern Africa. As the authors are physicians, the book presents some facts and observations not found in ordinary books on travel. There are interesting comments on little known tribes of natives with explanations of customs and habits. Among some tribes was found an unusual degree of intelligence with adaptations of modes of life apparently originated by these untutored people. Sufficient adventure is recited to make the narrative interesting and appealing. There is an unusual wealth of illustrations, especially depicting the appearance and habits of the natives. Anyone will find this an interesting volume of travel and adventure.

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Doctors and Specialists. A Medical Revue with a Prologue and a Good Many Scenes. By Morris Fishbein, M.D., Editor of the Journal of the American Medical Association. With Illustrations by Dan Layman. 118 pp. $1.00. The Bobbs-Merrill Company, Indianapolis, 1930.

This collection of brief satirical essays will afford joy to any physician who will take time to read it. Different sorts of doctors, including specialists, are dealt with in a summary manner, ending with the Christian Science practitioner and the chiropractor. Beside the obvious idiosyncrasies and banalities of various specialists there are presented for amusement many concealed vanities and personal conceits which are not commonly exposed to the observers. Perhaps many a reader will find a shoe which fits his pedal extremity, in which case he may wear it if he sees fit. The author is famous for his unique vocabulary which he uses with fluency on frequent occasions. This is employed with aptness and facility in exploiting each specialist who is playfully held up for the amusement of the reader. Not the least interesting feature is the suggestive illustrations which add to the joy and humor of the text. One will miss something if he fails to peruse this booklet.

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Gonococcal Infection in the Male. By Abr. L. Wolbarst, M.D., Urologist and Director of Urologic Clinics, Beth Israel Hospital, New York, etc. Second Edition, Completely Revised and Enlarged. With One Hundred Forty Illustrations, Including Seven Colored Plates. 297 pp. $5.50. The C. V. Mosby Co., St. Louis, 1930.

The reviewer finds this edition one of the most practical he has read. The author does not hesitate, like many writers, to outline his methods of treatment to the last detail. The usual antiseptics are used, he preferring the silver salts and potash. In chronic cases with prostatic and seminal vesicle involvement, he urgently advises vasotomy and injection of the vesicle. He has experienced no cases of sterility following the procedure.

The author states that diathermy has not been of any special value in epididymitis. Epididymotomy is his procedure of choice, if resolution is not prompt. Vaccines and foreign protein are satisfactory in complications, such as prostatis and epididymitis. He urges gentle, conservative treatment administered daily by the physician himself. He emphatically opposes self-administered treatment as being not only inefficient but dangerous. He adds that a thorough knowledge of the local pathology produced by the gonococcus will materially aid the attending physician. This book can be recommended as a useful addition to any physician's library. Corlett.

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Personal and Community Health. By Clair Elsmere Turner, M.A., Dr. P.H., Professor of Biology and Public Health in the Massachusetts Institute of Technology, etc. Third Edition. 443 pp. $21.75. The C. V. Mosby Company, St. Louis, 1930.

The author of this volume presents facts of healthful living and scientific principles upon which these health practices rest. Public health is considered from the standpoint of what one, who is not a sanitarian, needs to know in order to protect his family and meet the responsibilities of citizenship. Part I, dealing with personal health, has chapters on hygiene of nutrition, of the mouth, central nervous system and reproduction. Many problems are discussed in Part II which deals with community health. A chapter, entitled "Three Great Plagues," considers tuberculosis, syphilis and common cold. An appendix on the control of communicable diseases offers practical suggestions pertaining to all of them, arranged in alphabetical order. This book is intended for th eenlightenment of the nonmedical reader and can be recommended for this purpose.

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The Surgical Clinics of North America. (Issued serially, one number every other month.) Volume 10 No. 4 (Southern Number—August 1930). 268 pages with 96 illustrations. Per clinic year (February 1930 to December 1930), Paper, $12.00; Cloth, $16.00. Philadelphia and London. W. B. Saunders Co., 1930.

This volume presents reports from well known surgeons of the South, connected with hospitals and teaching centers in Louisville, Memphis, Columbia, New Orleans, Birmingham, Richmond and other cities. Haggard of Vanderbilt University reports on intrathoracic goiter, perforated duodenal ulcer, carcinoma of colon, enterogenous cyst ot ileum, complete avulsion of the scalp. Royster of Raleigh has interesting reports on aneurysm of the brachial artery, reconstructive endoaneurysmorrhaphy and huge aneurysm of the sciatic artery. McGuire of Richmond discusses medical versus surgical treatment of ulcer. Posterior gastroenterostomy on properly selected cases of duodenal ulcer is about the most satisfactory operation in surgery. Many other well known as well as unusual surgical conditions are discussed in this interesting volume.

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A Textbook of Message for Nurses and Beginners. By Maud Rawlins. Instructor of Massage to Nurses at St. John's Hospital, Brooklyn. Illustrated. 144 pp. $2.00. The C. V. Mosby Company, St. Louis, 1930.

The author does not attempt a scientific treatise on massotherapy. After presenting a brief history of massage, a chapter deals with theory. The purpose of this procedure is to improve blood circulation, increase body warmth, soothe nerves, eliminate waste matter, break down and reduce adhesions, swelling and thickening of tissues with stretching of contracted tendons. Different forms of massage are described with their application to different diseased conditions. This is an excellent monograph on this useful procedure.

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Lipodystrophy from Insulin Injections. In an effort to determine whether injections of insulin or other substances would cause a lipodystrophy, Lucille L. Reed, William E. Anderson and Lafayette B. Mendel, New Haven, Conn. (*Journal A. M. A.*, Aug. 9, 1930), injected healthy female rats subcutaneously in a pad of fat occurring on the ventral surface of the right leg with 0.6 unit of insulin daily, the dose being divided into three parts. (This dosage is on the basis of 3 units per kilogram of body weight, or 210 units for a 70 kilogram man.) Another group of rats was injected with the same volume of physiologic solution of sodium chloride at the same time in the same location. Still another group received no injections at all. The rats were killed after sixty days and the pelt removed. The amount of subcutaneous fat around the right and left legs was estimated separately for the rats in each group by the method described by Reed, Yamaguchi, Anderson and Mendel for the determination of the fat content of adipose tissue. The variations occurring in the groups injected with insulin or with physiologic solution of sodium chloride suggested that neither substance was influential in changing the amounts of fat stored in the subcutaneous tissues. It is conceivable that the adipose tissues of normal and diabetic organisms react differently to injections of insulin or that in the present instance the injections were discontinued before the lipodystrophy had time to develop. In any event the current hypotheses for the genesis of localized lipodystrophy after insulin injections have not been substantiated under conditions that may be regarded as sufficiently drastic to produce the expected results.

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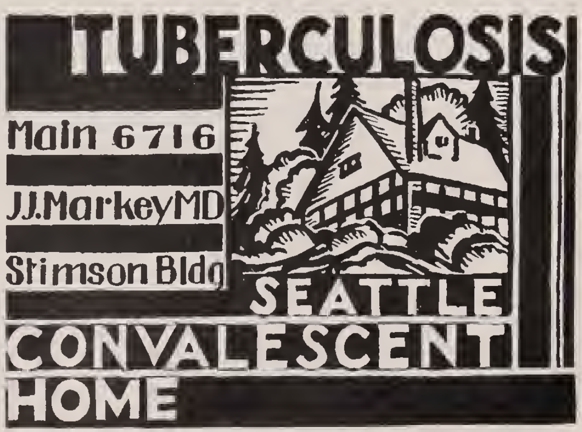

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**Sulphemoglobinemia.** George A. Harrop, Jr., and Reginald L. Waterfield, Baltimore (*Journal A. M. A.*, Aug. 30, 1930), report ten cases of sulphemoglobinemia. In the the cases sulphemoglobin was found and confirmed by various tests; and in not one single case did they find so much as a trace of the allied pigment methemoglobin. The pigment of sulphemoglobin was never found in the plasma, and it was found in the urine of only one patient, who had an incidental hematuria. These cases show the remarkable frequency of addiction to drugs containing aniline derivatives, and of habitual and severe headache and constipation in this disease. Only one of the first nine patients stated that he did not take aniline derivatives. Although for many years he had taken miscellaneous headache medicines (e.g., antikamnia), he had not taken anything except "aspirin" for four years. The acetylsalicylic acid he had taken in extremely large doses. Acetylsalicylic acid was continued but aniline derivatives were withheld, and this cyanosis gradually disappeared. The remaining eight patients had all been taking large doses of acetanilid over long periods, and seven of them had been taking the acetanilid in the form of "Bromo-Seltzer," the dose of which varied from "three to four doses a day" to "two or three 30-cent bottles a day." Habitual and extreme headaches were common to all the nine patients. In most of them, these had started in youth and increased in severity through life. Of the nine patients, six had suffered ever since childhood with chronic constipation of extreme degree. In practically all of them there was noticed a definite relation between the constipation and the headache. Emotional instability was a striking feature in all the first nine cases and was probably mainly a manifesta- of the drug addiction. The tenth patient had not been habitually constipated, nor was she a martyr to chronic headaches or the drug habit. Emotionally she was normal. Briefly, she had worked three months out of each year for the last four years in a cotton mill with aniline dyes, which smelled strongly of hydrogen sulphide and deeply stained her hands. She had had three previous acute attacks similar to the present one though less severe, each occurring during the period she was at work. They consisted of violent and continual vomiting, with intense headaches, definite mental manifestations, and blueness of the lips and nail beds. In the last attack the cyanosis of the lips and nail beds was extreme. Following the onset of this last attack, after she had begun to become blue, she started taking "headache powders" and had continued with them for three weeks before admission. Examination of the dye showed that it smelled strongly of hydrogen sulphide and that it liberated large quantities of that gas when treated with acid. In all these cases, on the exclusion of aniline derivatives and allowing only such drugs as the salicylates, acetylsalicylic acid and codeine, the cyanosis underwent a very gradual but definite subsidence. Experiments on splenectomized dogs demonstrate that, at least in these animals, there is one way of producing a true "enterogenous cyanosis."

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**Foreign Bodies in Elbow Joint.** This type of injury, giving rise to a foreign body in the elbow joint, F. J. Kirby, Baltimore (*Journal A. M. A.*, Aug. 9, 1930), has designated "the baseball pitcher's elbow." The cases he has seen occurred in strong young men, who were pitchers on the baseball teams in their respective colleges. In each case, the injury which later led to the formation of the foreign body in the elbow joint occurred while the patient was pitching during a game of ball. During the wind-up in the act of pitching a ball, the arm and forearm should be held in extension and the throw of the ball should be from the shoulder. Frequently a pitcher, during the wind-up, will hold his forearm in slight flexion; then as he prepares to throw the ball, by suddenly and forcibly contracting his triceps muscle and rotating his forearm and hand inward and downward to give all possible speed to the ball as it leaves his hand, he extends the forearm rapidly and fully and the head of the radius is brought backward suddenly and with great force against the condyle of the humerus. The result is that a small piece of cartilage and bone from the head of the radius is chipped off—a chisel fracture of the head of the radius. This small, broken-off piece of bone and cartilage remains about the joint and by constant irritation it is likely to increase somewhat in size. In one case the foreign body was free in the joint; in the other three it was attached by a thin, string-like pedicle. The treatment consisted of opening the elbow joint over the head of the radius and removing the foreign body, and then closing the wound. The lesion (fracture) occurs on the posterior surface of the head of the radius. The bodies varied in size, form one the size of a coffee bean to two as large as almonds, and oval.

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**Recent Contributions of Medical Men to Surgical Progress.** William J. Mayo, Rochester, Minn. (*Journal A. M. A.*, Aug. 30, 1930), says that when he began the practice of medicine, hospitals had surgeons and clinicians who were differentiated by title, but in actual practice the surgeon was a clinician who devoted more of his time to surgery than to medicine. The surgeon made the general examination and the diagnosis, operated on the patient, and cared for him after operation. Today the enormous advance in surgery has split the surgical profession into groups of specialists in fields which often are small, possibly too small. The surgeon has largely lost touch with general medicine, and because of this limitation he is dependent on the clinician as never before. If medicine is considered in its broader sense, the man who has been trained in medicine and who has not lost himself in an attempt to memorize the minutiae of laboratory technic more nearly has maintained his place as a well informed practitioner than has the surgeon. Mayo discusses briefly a few problems that concern medicine and surgery; these depend on a better understanding of physiology and have been developed through experimentation on animals and through clinical investigation. Concluding, he says: I come now to a matter of great significance to the medical profession. It was noted in the Royal Victoria Hospital of Manchester, England, that the death rate among the surgeons on the staff was more than three times that among medical practitioners in the same age period. It is true that much of the disability among surgeons is due to the fact that surgery is to a certain extent a handicraft and that age and anxiety produce a reduction in skill; but, after all, that is not the most serious consideration. The keen clinician, as he grows in experience, becomes more and more valuable as age advances. He is not exposed to those malign influences of anxiety and responsibility to the extent as is the surgeon. One might say that the clinician sees his patient drowning and throws him the best means of relief that he has, but that the surgeon in order to give relief jeopardizes the patient anew, and in a different way, that relief may follow. It is noticeable that a common cause of death among surgeons is disease of the heart, especially coronary stenosis, coming on in the latter part of the sixth and the early part of the seventh decade of life. In all other respects the surgeon maintains his general health equal to others, and often postmortem examination does not show evidence of other serious disease. The tendency to death from heart disease is not confined to surgeons but is common among all men who lead lives of stress, in which stern control of the emotions is necessary. With the better understanding of general physical conditions, I hope there may be an advance in the understanding of certain diseases of the heart which directly concern the surgeon. I recall with great sadness my many friends among surgeons who, around 60 years of age, have died from coronary stenosis and disease of the cardiac muscle. With the remainder of their bodies in excellent condition, why should many men who work under this great emotional strain, controlled by effort of will, succumb to this deadly malady? Here is a problem for clinical investigation which demands the aid of experimental investigation and laboratory studies, in which the surgeons may possibly aid in affecting their own salvation.

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# CYSTECTOMY WITH BILATERAL TRANSPLANTATION OF THE URETERS IN ONE OPERATION

## PRELIMINARY REPORT ON FIVE CASES

Robert C. Coffey, M.D.
PORTLAND, ORE.
Clinical Professor of Surgery, University of Oregon Medical School

At the December, 1929, meeting of the Southern Surgical Association, at Atlanta, Georgia, I presented a paper on "Radical Treatment of Cancer of the Bladder,"[1] at which time I reported eight cases of advanced cancer of the bladder on which bilateral transplantation of the ureters was done. In four of these cases definite metastasis existed, precluding any attempt at radical operation. In these four cases the ureters were transplanted by the tube technic. The patients survived operation and later died normal cancer deaths without uremia and without demonstrable evidence of kidney involvement which could be attributed to the operation. In one of these cases, however, only a partial postmortem was made by the family physician who reported serious damage to the kidneys, but this case was very far advanced at the time of operation and it was known that the kidneys were seriously damaged at that time.

In two other cases destructive doses of radium were used. In one of these the bladder was entirely destroyed by the radium. Patient lived eighteen months and died a sudden death. No postmortem and no doctor was present. In the other, after having destructive doses of radium, the bladder was destroyed with a cautery. In this case the growth returned within thirty days. The entire cavity of the wound was studded with cancer transplant areas, from which the patient died two months afterward.

In another case the growth was fairly early. The growth was treated with radium, followed by cystectomy. This operation was performed in August, 1928. The patient is still alive and well and has no disturbance from the urine in the rectum.

In the remaining case the growth was much farther advanced. It was treated by large destructive doses of radium, followed by cystectomy. This patient was operated on in August, 1929, and is still well, kidneys function perfectly, and there is no evidence of recurrence.

This paper was closed with the following statement: "The ideal for which we yet hope is the early diagnosis of cancer, when it is still confined to the bladder wall, in which case the skilled surgeon will be able to transplant the ureters and do the cystectomy at the same operation, leaving an extraperitoneal quarantine at the lower end of the abdomen to drain the visceral space as well as the transplantation area."

On March 12, 1930, my opportunity came. My distinguished friend and schoolmate, Dr. W. D. Haggard, referred a relative of his, who lived near Portland, to me for operation for cancer of the bladder. This case was reported with figures 1,

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[1] Coffey, R. C.: Radical Treatment of Cancer of the Bladder. South. Surg. Trans., Vol. XLII, p. 224, 1929.

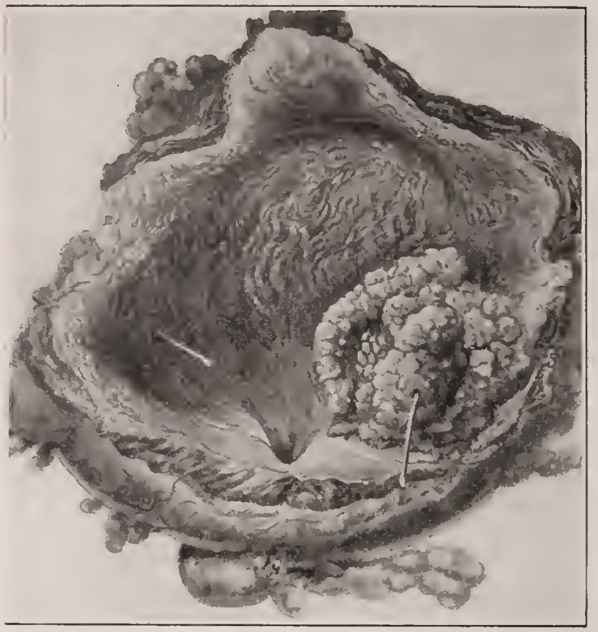

Fig. 1. Bladder specimen laid open through posterior wall, showing the growth involving the right ureteral opening. Case 1.

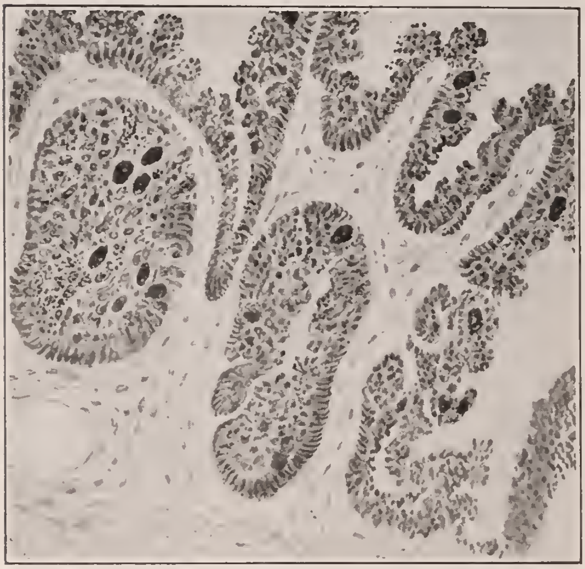

Fig. 2. Microscopic section of growth. Case I.

2, 3 and 4 in the June, 1930, *Annals of Surgery*[2] as follows:

Case 1. C. E. R., male, poultry farmer, age fifty-nine. He had a history of having had blood in his urine off and on for about three years. On December 12, 1929, he began to have severe pain in the right kidney region. This persisted until the latter part of January, when he began passing clots of blood. This bleeding continued. A diagnosis of cancer of the right side of the bladder had been made by a urologist.

He entered our clinic March 12, 1930, and the diagnosis of cancer was confirmed. As he was having a great deal of bleeding and a great deal of pain, he was advised to have it operated upon with the understanding that he would probably have his bladder removed and the ureters transplanted into the rectum. He went home to arrange his affairs. During these few days at home he had an alarming hemorrhage from the bladder. A doctor was called to give him relief. At the time he first consulted us, he had hemoglobin of 96; blood pressure 170/100; urine showed blood and pus but otherwise was normal.

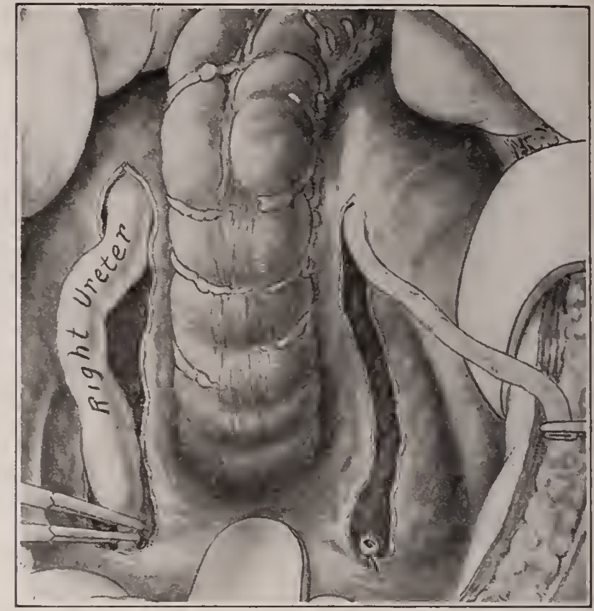

Fig. 3. Right ureter enormously dilated as result of passing through the growth. Case 1.

He returned and entered the hospital March 20, with hemoglobin of 66. A blood transfusion was given. On the 22nd his hemoglobin was 78. He was operated upon March 22, at which time the ureters were transplanted into the large intestine by the technic described in November, 1928, *Surgery, Gynecology and Obstetrics,* and the bladder was removed by the technic described in the June, 1930, *Annals of Surgery,* page 912.

At that time it was observed there was a cancer of the bladder one and one-half inches in diameter, involving the right ureteral opening which also infiltrated the bladder wall (figs. 1 and 2). The right ureter was dilated to the size of the index finger (fig. 3). The pelvis of the right kidney was correspondingly dilated and hydronephrotic. The left ureter was thickened but only slightly dilated. The left kidney appeared to be normal. While the patient was not greatly shocked, his hemoglobin was low and it was decided to give him another blood transfusion at the close of the operation. He left the operating room with a pulse of 76, full and of good quality.

*Progress.* The temperature the day before the operation was 102° and remained so until two days after the operation. After this during convalescence it ranged from normal in the morning to 99° and 100° in the afternoon. During four days it went as high as 101° in the afternoon and the pulse was over 100 on five separate days during the convalescence. At no time did the patient present the appearance of being seriously ill.

The total output of the left kidney during the first thirteen days was 16,985 cubic centimeters, while that from the right hydronephrotic kidney with a dilated ureter was 3,467. By the phenolphthalein test, the dye oc-

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[2] Coffey, R. C.: Transplantation of the Ureters. Ann. Surg., June, 1930.

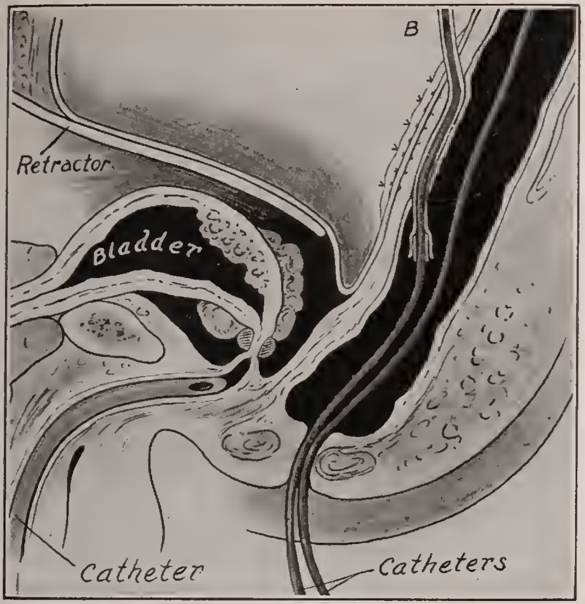

Fig. 4. Last step in removal of bladder. Case 1.

curred in the left kidney in six minutes and in the right in twenty minutes. This delay in the right kidney, however, may have been due to the larger capacity and the less secretion which required a longer time to reach the end of the catheter from the kidney pelvis. The function in this dilated kidney is in accordance with our former observation in cases where the ureter has been enormously dilated at the time of operation. In all such cases, the kidney is correspondingly damaged and apparently never entirely recovers. During the thirteen days that the catheter remained in, so that comparison could be noted, there was no change in the relative output of the two kidneys.

At the end of eight days, the gauze pack was removed from the bladder space and was lightly repacked with sterile gauze. A week later the packing was again changed without anesthetic, wound held open by retractor, lighted with Cameron lights and wound inspected inside. This was done again in six days, at which time the wound was washed out very carefully and a beautiful granulating cavity was exposed and inspected. This has gradually closed. There was never at any time the slightest pain or discomfort in the region of either kidney. Patient's appetite has been fairly good and it may be said he made an uneventful recovery, has gone home and is seemingly entirely well.

It is interesting to report October 1, 1930, that this patient is entirely well and fully able to carry on his poultry farming. He claims that he has not the slightest distress from the urine in the rectum. He usually gets up once at night.

Case 2. M. R., woman, aged 45, teacher, unmarried. Referred by Dr. G. E. Chittenden of the Akron Clinic, Akron, Ohio, who included the following history in his letter:

"About two years ago while at Edinburgh, Scotland, she was taken with what was apparently an attack of pyelitis. In November, 1928, she was under the care of a urologist in the Cleveland Clinic. Since that time she has had fulgurations of the recurring bladder papillomata in the Akron Clinic and in the Jackson Clinic of Madison, Wis. She has been under my care since February, 1930. At that time she was having frequency, urgency, nycturia and microscopic hematuria.

"At cystoscopic examination, I found a very acutely inflamed bladder with considerable edema of the mucous membrane but could not get any detailed information. She had bladder irrigations for two weeks and another cystoscopy was done, at which time I found two small papillomata slightly anterior to the left ureteral orifice and one larger papilloma about the right ureteral orifice. These were fulgurated on Feb. 28, under nitrous oxide anesthesia. Cystoscopy about the middle of March revealed a fairly normal bladder mucous membrane except for some injection of the blood vessels. At a pelvic examination about this time, I could feel no definite tumor mass in the bladder area but I did feel something which I thought was the ovary lying close to the bladder on the right side.

"In the past month she has had a return of hematuria, and cystoscopy about three weeks ago revealed a more proliferating process around the right ureteral orifice. One week ago I removed a piece of tissue from this area and the section revealed definitely epitheliomatous neoplasm. In the intervening three weeks between the two cystoscopies there was more extension around and behind the right ureter.

"I have advised operation and told her that because of the recurrence of the growth on both sides of the bladder walls, it would possibly be necessary to do a ureteral transplantation and cystectomy."

The patient registered at our Clinic June 23, 1930. Physical examination showed systolic blood pressure 122, diastolic 90, pulse 70, temperature normal, hemoglobin 80, occasional extrasystole with slight mitral regurgitation. The patient is rather feeble in appearance.

Cystoscopic examination was reported as follows: Bladder capacity small. There is a rather large growth occupying the posterior wall of the bladder just above the ureteral orifices. The growth is largest just above the right orifice, where it mounds up. It then seems to extend under the mucosa to the region above the left ureter, where it again crops out in a papillomatous mass with a broad base. Diagnosis: Cancer of the bladder.

On June 28 the operation was performed under ethylene gas. Operative findings: The growth involved the entire thickness of the bladder over a large area and seemed to infiltrate the connective tissue around the bladder. The ureters were dilated and inflamed. The right ureter was particularly dilated and thickened, obviously from an infected kidney which was swollen at the time.

Operation: Through a long median incision, extending down to the pubes, bilateral transplantation of the ureters by the tube technic described in *Surgery, Gynecology and Obstetrics,* November, 1928, was done. Transplantation was easy. After the wicks and gutta percha tissue were placed in the slits of the peritoneum for retroperitoneal drainage, the bladder was removed, requiring about twenty-five minutes. The growth infiltrated the connective tissue around the bladder which made dissection near the base of the bladder difficult. The vagina was opened during the process. The wound was packed with gauze. After operation, 600 c.c. of whole blood was given by transfusion.

*Progress.* While the patient was not seriously shocked from the operation, her condition was especially good after the transfusion. The right catheter began to drain soon after operation, left one a little later. The urine from the right catheter was purulent and filled with flaky mucous substance. Right catheter became blocked about twelve hours after operation and it was impossible to keep it open. Water injected into the catheter did not return.

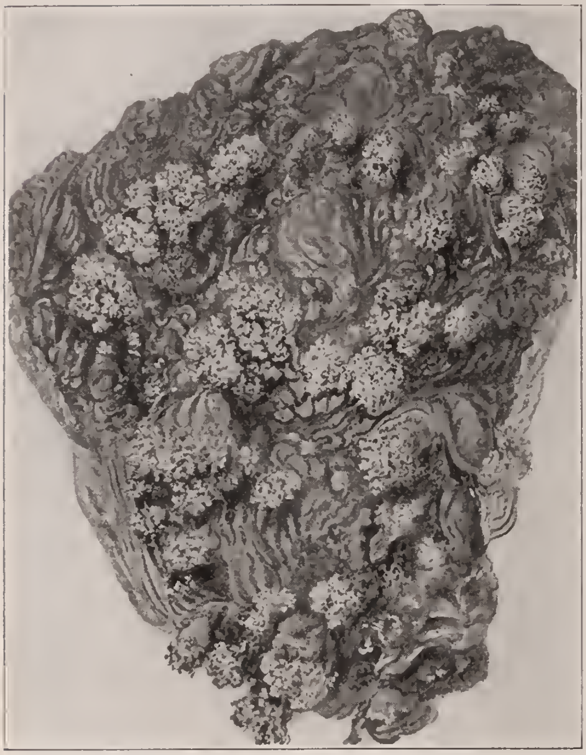

Fig. 5. Mucous membrane of open bladder studded with papillomata. Case 3.

This phenomenon is noted when the eye of the catheter is filled with a clot. There was a slight discharge of foul smelling liquid from the catheter.

Twenty-four hours after operation, patient had a slight chill and forty hours after another chill. After forty-eight hours, there being no drainage from the right kidney, a loin incision was made under local anesthesia so that the ureter could be reached and opened. Considerable purulent fluid poured out. A catheter was inserted into the proximal ureter far enough to reach into the pelvis of the kidney. Small wicks surrounded with rubber tissues were placed in the wound and made to contact the slit in the ureter. After a few hours the crippled right kidney began to discharge normal urine through the catheter and continued to do so.

Twenty-four hours after the operation patient developed marked arryhthmia and showed decided cardiac symptoms, but apparently was not very sick otherwise. From the time the catheter was placed through the loin into the right kidney, it seemed to secrete a normal amount of urine. There was no evidence of peritonitis and no uremia and even no increase in blood urea. The pulse was very irregular and, while it was not rapid on the fifth day, she suddenly turned worse and died on July 5, seventh postoperative day.

Postmortem made by Dr. Foskett, pathologist, showed the following: Peritoneum is moist, smooth and glistening throughout with the exception of areas in contact with drains. On opening the abdomen there is evident a slight amount of hematoma at the site of the surgical wound. A portion of the omentum is attached in the pelvis and its surfaces covered with fibrinous exudate. These areas have apparently been in contact with the gauze drains which are packed in the pelvis. The lower pelvis is studded with areas of necrotic tissue. The stomach is moderately dilated. The gallbladder projects below the costal margin.

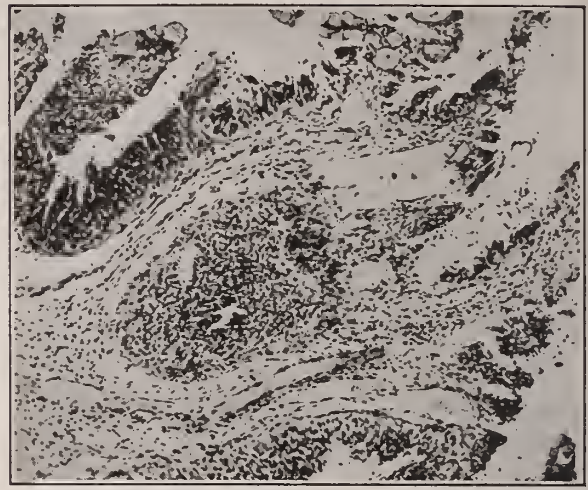

Fig. 6. Microscopic section, showing the epithelium of the multiple villous papillomata. Necrosis and graulation tissue are present. Case 3.

On opening the chest the lungs meet in the midline and appear to be normal. The space occupied by the pericardium is not increased in size. The heart is normal size. There is no evidence of any pathologic change in the pulmonary valve leaflets, nor in the leaflet of the tricuspid valve. The aortic valve leaflets are soft and pliable. The mitral valve leaflets reveal no gross pathologic changes.

The left kidney is approximately normal in size. The ureter reveals evidence of congestion but is not dilated. The lining of the pelvis of the kidney reveals evidence of moderate hemorrhage. There is moderate cloudy swelling of the parenchyma. The right kidney reveals more marked congestion. There is no evidence of dilatation of this ureter.

The postmortem did not reveal a satisfactory physical cause of death. The kidney functioned perfectly to the last and there was no uremia or increase of blood urea. The direct cause of death probably was myocardial weakness, marked by an uncontrolable arryhthmia which began twenty-four hours after the operation. It was very evident before the operation was complete that the growth was of too long standing and too far advanced to offer much hope to the patient. The growth was so far advanced that in removing it the bladder was opened and had to be removed in pieces. Hence, the specimen is not pictured.

Case 3. G. E. S., male, age 51. Patient was referred by Dr. H. E. Cleveland of Burlington, Wash.

He registered at our Clinic August 2, 1930, with the following history: In November, 1928, had a left nephrectomy for what had been diagnosed stone in the kidney. No stone was found but the kidney was found to have a papilloma in the kidney pelvis. Patient continued to have a great deal of distress in the left side. Some papillomata began to appear in the bladder.

About the first of February, Drs. Tate Mason and Cleveland removed the ureter down into the bladder and excised a small portion of the bladder around the ureteral opening. Patient still continued to have distress and the papillomata increased rapidly until they had scattered over the entire area of bladder mucosa (figs. 5 and 6). The urologist at the Mason Clinic fulgurated vigorously but the papillomata persistently recurred. The patient was in very great distress, lost some blood, and it was conceded that the bladder must certainly be dispensed with in some way.

After discussing all phases, it was thought best to have the ureter transplanted and the bladder removed. The patient entered our hospital on August 2 and was prepared for operation on August 5. The right ureter was transplanted by the technic given in *Surgery, Gynecology and Obstetrics,* November, 1928, and the bladder was removed, after which the vesical space was packed with a five yard gauze tape* which controlled the hemorrhage.

In this case an attempt was made to find the anterior trunk of the internal iliac artery as was done in Case 1, but there must have been an anomaly as it was not possible to find this branch. The bladder was removed down to the neck, including the mucosa covering the prostate. Wound was packed with gauze to control the hemorrhage and on the outside was placed rubber tissue to prevent the gauze from attaching to the obturator nerve which always runs across the pelvis from above downward like a taut string.

*Progress*: During the first twenty-four hours after operation, the temperature ranged from 99° to 100,° pulse 110, with the catheters draining well. Second, third, fourth and fifth days uneventful. On the sixth postoperative day patient was given gas and the gauze pack removed. He complained of pain low down on the right side and on the inside of the leg which is so characteristic of obturator nerve pain. On August 17, twelfth postoperative day, the catheter came away.

Recovery of the patient was uneventful until August 20, fifteenth postoperative day, when he had a slight chill and was somewhat nauseated, followed by a temperature of 104° which rapidly receded, until on the following day it was normal. On the following evening, he had another slight chill with a temperature of 102°. His temperature then for several days varied from normal up to 102.° This slight rise of temperature, alternating with normal, continued until the patient left for home on August 9, thirty-fifth postoperative day. Wound had practically healed. He was having no distress with urine in the rectum and felt well.

We were never able to determine positively just what caused the elevation of temperature. The urine seemed to be delivered in the rectum entirely clear and there was never any soreness in the neighborhood of the kidney. It is quite possible that there might have been some local accumulation in the drainage cavity. It was not severe and the patient lost no flesh and he seems to be in good condition at the time of writing.

Case 4. J. D., male, age 45. Referred by Dr. R. T. Boals of Salem, Oregon, in whose letter of reference is the following: "I have made a cystoscopic examination of the patient's bladder and got a small piece of tissue of the same and had it examined by Hollister-Stier Laboratory of Spokane. Patient has a bleeding ulcer on the left side at the base of the bladder, one-half inch below the mouth of the left ureter which bleeds quite freely. He has a toadstool-like growth about one-half inch to the left of the right ureter and on the base of the bladder. My diagnosis is papillary carcinoma of the bladder. Visualization of the kidneys by uroselectan shows both kidneys practically normal, also by the same means shows the left ureter all right for the last four inches."

The following history was obtained from the patient on August 18, 1930: First noticed bleeding from the bladder about four or five years ago. Did not last very long. Cleared up in a few days. About a year later upon doing heavy work again noticed some bleeding, but has always had a little discomfort in left side of back in kidney region. Last February had quite severe hemorrhage with clots. Patient became very weak, some loss of weight. Had some medication. Better for a month. Since that time on any exertion there has been bloody urine. About two weeks ago passed a piece of tissue which was sent to the laboratory.

The diagnosis of papillary carcinoma of the bladder was confirmed microscopically by our own pathologist; also by Dr. Spangler of our Clinic who made the urologic diagnosis for us.

Operation was performed on August 21. For the purpose of avoiding transplants in case of accidental opening of the bladder, it had been filled with 95 per cent alcohol at the same time the rectum was packed with gauze. The catheter used to introduce the alcohol was then clamped so that it remained in the bladder during the entire operation.

Through the abdominal incision, bilateral transplantation of the ureters by the technic described in *Surgery, Gynecology and Obstetrics,* November, 1928, was performed except that the slits in the peritoneum were closed entirely, owing to the fact that drainage was later to be established in the space occupied by the bladder. After the transplantation of the ureters was done, the pelvis was packed full of gauze as protection against soiling of the field in case of accidental rupture of the bladder. When the cystectomy was begun the alcohol was withdrawn. After the removal operation was completed, the vesical space was packed with a five yard gauze tape (fig. 7). At the time of the packing, both obturator nerves were noted to run along the outer pelvic wall. Incidentally it may be stated that these nerves are very conspicuous and stand

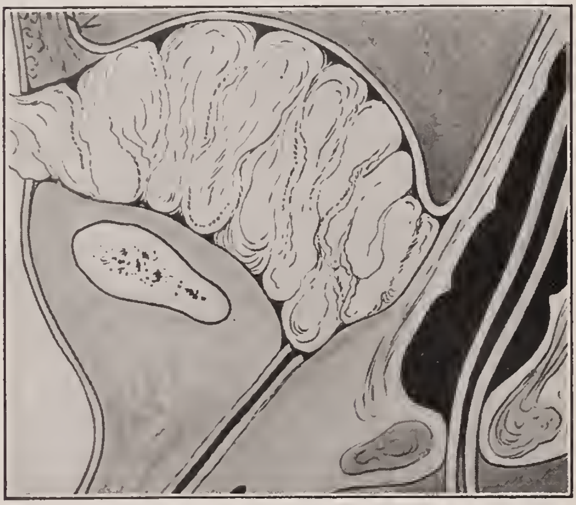

Fig. 7. Gauze pack in vesical space. Case 4.

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*A gauze strip, twelve inches wide and five yards long is folded to four thicknesses, edges inside. This makes a 15-foot tape. Beginning at one end, this tape is folded back and forth like the folds of a fan until 8 or 10 double folds have been made into a pack. From the proximal side a heavy quilt suture is passed through the pack and back, and then tied firmly, leaving the ends at the knot an inch long.

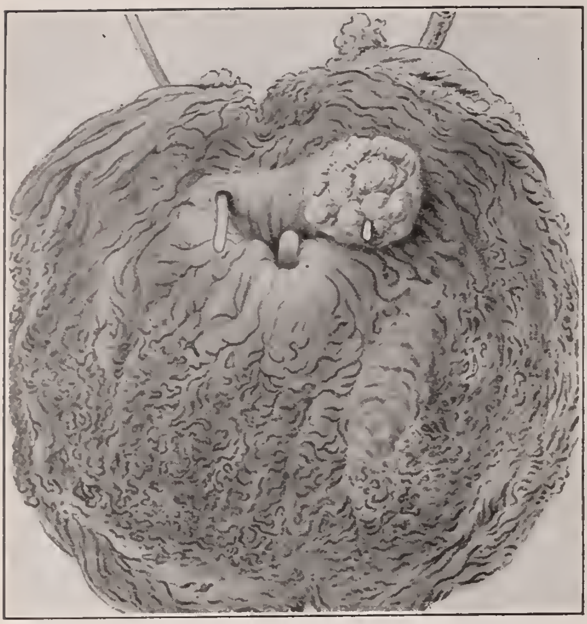

Fig. 8. Bladder open, showing carcinoma involving left ureteral opening. Case 4.

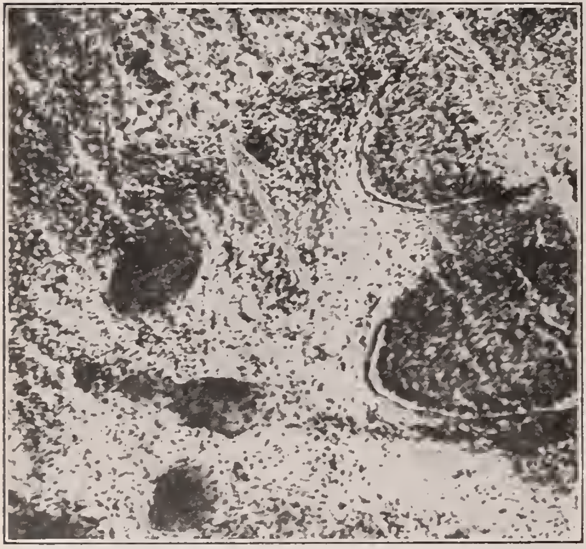

Fig. 9. Microscopic section, showing arrow pointing to malignant change. Case 4.

fully one-half inch from the muscular wall and sometimes account for a pain running down the inner side of the leg which is brought about by too tight packing of the pelvic cavity. The anterior trunks of the internal iliacs were not ligated and were not very much in evidence but all the larger blood vessels could be easily ligated by sight. While the loss of blood was not great, a transfusion of 600 c.c. of whole blood was used as an extra precaution (figs. 8 and 9).

*Progress.* No shock followed the operation and convalescence was uneventful. The temperature once or twice went as high as 101° and only during the first two postoperative days was the pulse above 92. Both catheters drained from the beginning and throughout convalescence until August 31, tenth postoperative day, when the right catheter came away and urine discharged into the rectum and was carried off for a few days by a rectal tube. On September 6, the sixteenth postoperative day, the left catheter came away. The gauze pack was removed at the end of the first week with light gas anesthesia and after the wound was thoroughly irrigated and cleansed, the wound was repacked with a five yard tape of gauze. At the end of the second week, gauze was again removed, a bivalve vaginal speculum was inserted in the wound, wound thoroughly irrigated by introducing the fluid with a flushing tube and withdrawing it through another suction apparatus. The cavity was carefully inspected and gauze reinserted. This was repeated every five days until the thirtieth postoperative day, when the patient was permitted to be up on his feet.

Recovery continued uneventfully. The urine was held for two or three hours at a time and the patient was not uncomfortable. Occasionally the rectal sphincter for the first few days would allow a little leak of the urine. This is true in nearly all cases until the sphincter becomes adjusted to holding fluid.

Case 5. M. V., female, age 62, married, mother of ten children. Referred by Drs. A. P. Procter and also R. C. Weldon of Vancouver, B. C., who had made the diagnosis of carcinoma of the bladder and had given deep roentgen-ray treatments on the following days: August 26, 27, 29 and September 2, 1930.

Patient registered in our Clinic on September 6, and gave the following history: For many years has been troubled with burning and distress in the bladder with frequency of urination. For the past year has been passing blood off and on. This frequency has increased lately. During this year she has lost thirty pounds in weight. About three weeks ago she had quite a severe hemorrhage from the bladder.

At the time she entered the Clinic, she had a sallow complexion. She stated that the roentgen-ray treatment had made her very sick and she had developed a slight jaundice. Our cystoscopies confirmed the diagnosis of advanced carcinoma of the bladder, involving the left side of the wall and particularly above the ureters. A dose of castor oil was given the patient for the purpose of preparing the bowel for ureteral transplantation. This made her very ill and she vomited severely for nearly twenty-four hours. After this she recuperated and began to feel quite well but complained of great distress in the bladder. On September 8, she was given a transfusion of 600 c.c. of whole blood.

On September 9, the operation was performed. After the abdomen had been opened and the rectum had been cleansed and packed with gauze in preparation for doing transplantation of the ureters, a catheter was inserted and the bladder was filled with 95 per cent alcohol which was to remain until the transplantation operation was complete.

After the abdomen was opened, the kidneys were carefully palpated. The right kidney was slightly smaller than normal, somewhat lobulated, pelvis somewhat dilated. Right ureter was but slightly dilated. Upon exposing the pelvis for lighting the ureters, it was observed that the left ureter was very large and deeply congested, particularly that part below the crossing of the psoas muscle. After the peritoneum had been slit and the left ureter lifted, it was found to be as large as a man's index finger, filled with urine, deeply congested and of a purplish color. It was clamped and ligated down in the connective tissue of the broad ligament. At the point near the lower clamp was discovered a small hard gland, about three times as large as a millet seed.

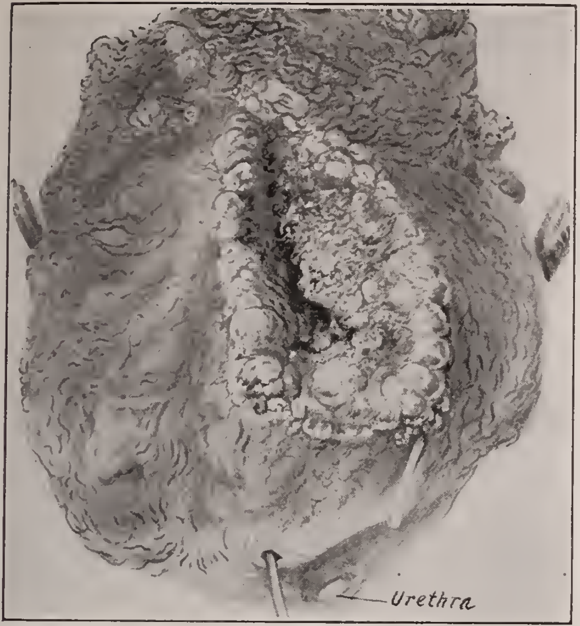

Fig. 10. Advanced carcinoma encroaching on left ureteral opening. Case 5.

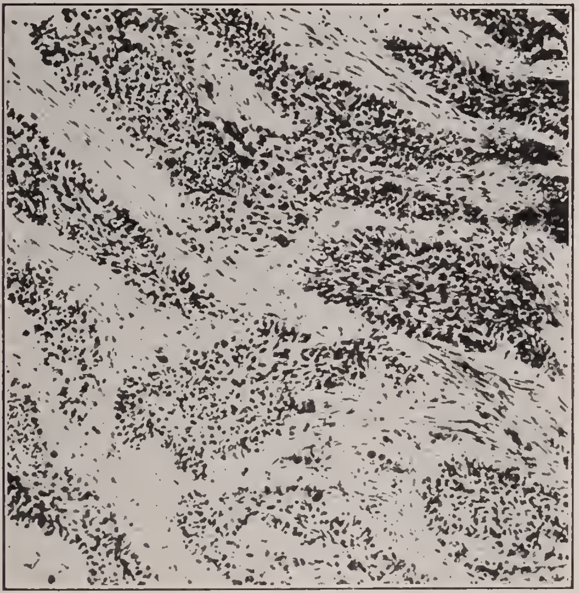

Fig. 11. Microscopic section of infiltrating carcinoma. Case 5.

This was removed and submitted for frozen section. The pathologist reported that the growth was Grade IV carcinoma, Broder's classification. Careful search was made for other glands along the ureter, both above and below the point of section, but none could be found. The right ureter was larger and thicker than normal but not materially dilated.

The ureters were transplanted in accordance with the technic shown in *Surgery, Gynecology and Obstetrics,* November, 1928. Both catheters began to discharge urine immediately, while the patient was still on the operating table. It may be stated in passing that no metastatic nodule could be felt in the liver and no evidence of high metastasis. The purplish, dilated condition of the left ureter was cause for a good deal of apprehension and the possibility of its later sloughing above the anastomosis could not be eliminated. Wicks were placed in the lower angle of the incision posterior to the peritoneal incision back of the uterus, from which the ureter had been lifted, and rubber tissue above.

At this stage of the operation the clamp was released from the catheter and the alcohol allowed to escape from the bladder. An infiltrating growth could be felt on the left side of the base of the bladder in front of the left ureter. The growth seemed to have invaded the connective tissue to a certain extent. The pelvis and the entire lower portion of the abdomen were temporarily packed with dry, sterile gauze to prevent possible soiling in case of accidental rupture of the bladder during operation. The vesicouterine fold of peritoneum was slit transversely and the bladder was gradually pulled forward by gauze in a gloved right hand, while the left hand mobilized the bladder from the vagina and lateral pelvic wall.

The bladder was separated from the vagina as far down as could be done conveniently and the growth on the left side had been mobilized from the connective tissue of the left broad ligament. Vessels were isolated and clamped. After the fundus of the bladder had been well mobilized, the neck was identified by the catheter which still remained in the bladder. The urethra was thereby isolated and held between the left thumb and index finger of the operator. A nurse then withdrew the catheter, while the operator held the urethra and doubly clamped it. It was then severed and the bladder was separated from the vaginal wall and its lateral attachments from the urethra backward. By working first above and then below, the bladder, to which was attached the ligated stumps of the ureters, was finally removed with relative ease (figs. 10 and 11). No great amount of blood was lost. Patient, however, was already anemic and 600 c.c. of whole blood was given by direct transfusion. The vesical space between the uterus and pubic arch was packed with a ten foot tape of gauze to control the slight oozing and to drain the space into the gauze.

*Progress.* Both catheters began to drain. The patient vomited persistently after the operation, much the same as she had following the dose of castor oil. Fluid was supplied by subpectoral infusion. The vomitus was principally mucus and clear fluid. During all the period of vomiting, she had an intermittent pulse. On the third postoperative day vomiting ceased and she began to take beef juice and albumin water. Her appetite was poor and she belched a good deal.

The day after operation, the left catheter gave a good deal of trouble. The eyes of the catheter were blocked by debris from the dilated ureter and kidney pelvis. In view of the condition of the ureter at the time of operation and the possible danger of its sloughing at a later stage, it was decided to expose the left ureter below the kidney and drain it. Under local anesthesia, along the line of the usual kidney incision, the kidney fat was exposed and opened and a finger passed along the posterior abdominal wall until the ureter containing the catheter was easily palpated. With a flat hook retractor, it was pulled slightly toward the wound. A longitudinal incision was made through its wall down to the catheter. No urine escaped. The ureter at this point was by no means so large as it was in the pelvis. Four small wicks were placed, two on each side of the ureter. This was surrounded by two sheets of rubber tissue, making a cigarette drain. The catheter began to drain freely while the patient was on the table and never became blocked again. As far as could be determined, no urine escaped from the incision in the ureter as long as the catheter remained in the bladder.

On the ninth postoperative day, the left catheter ceased to drain and a few hours later it came away. The urine poured freely into the rectum but none drained through the loin wound. On the eleventh postoperative day the right catheter came away. There has been no evidence of trouble of any kind with the kidneys; pulse and temperature are practically normal, pulse being about 88 and the maximum daily temperature about 99½.°

On the fourteenth postoperative day the patient is slightly jaundiced, although not so much as on the third. She feels tired, slightly nauseated but does not vomit her meals. She takes a fair amount of semisolid nourishment but has a poor appetite. The symptoms are very much the same as before the operation after the deep roentgen-ray treatment. There is no evidence of sepsis, no evidence of kidney infection and it now seems that the patient may recover, despite her sallow complexion and jaundice which we cannot entirely explain at this time.

### IMPRESSIONS

While it is far too early to draw any conclusion as to the feasibility of this operation and as to the scope of it, the outlook is so far very encouraging. Contrary to what one might expect, cystectomy combined with transplantation of the ureters is far easier and less dangerous in man than in woman because of the presence of the uterus in woman which makes two areas of drainage necessary. After cystectomy in man, there is but a single drainage area, and this is all extraperitoneal. In woman the wick drains to take care of the possible drainage of ureteral anastomosis are intraperitoneal. The pack in the vesical space constitutes an additional drain.

From my experience with the three men above reported, I am satisfied that the operation of cystectomy, combined with bilateral transplantation of the ureters for cancer of the bladder, is entirely feasible in male patients and is far preferable to the two stage operation. I would not hesitate to use it in any case of early carcinoma of the bladder in man. Judging from these three cases, I feel that, if the operation is properly done by one who has thoroughly learned the technic of ureteral transplantation, the mortality will be relatively low.

I am not entirely convinced that it is wise to do the combined operation as a routine for cancer of the bladder in woman. The two cases in which I have first transplanted the ureters and later removed the bladder have been most satisfactory and free from trouble. The two cases in which I have done it all at one sitting have had a stormy convalescence, possibly because the patients were poor subjects and the growth far advanced. It is possible that early carcinoma of the bladder in otherwise healthy women may be best treated by the combined single operation but I would recommend the two stage operation.

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# OBSTETRIC CASES AT THE MINNEAPOLIS GENERAL HOSPITAL

## A FIVE YEAR STATISTICAL SURVEY

Fred L. Adair, M.D., F.A.C.S.
CHICAGO, ILL.
Formerly Chief of the Obstetric and Gynecologic Service, Minneapolis General Hospital

AND

Martin S. Sichel, M.D.
PORTLAND, ORE.
Formerly Resident of the Obstetric and Gynecologic Service, Minneapolis General Hospital

This study covers the five year period from January 1, 1923, to January 1, 1928. All obstetric cases entering the hospital during this time are included. The series comprises a total of 7,226 cases, of which 5,911 or 81.8 per cent were maternity cases, 1,272 or 17.6 per cent were abortion cases, and 46 or 0.6 per cent were extrauterine pregnancies.

There were fifty-seven deaths in the entire series of 7,226 cases, a maternal mortality of 0.78 per cent or 7.8 per 1000 women, or 9.9 per 1000 living births. This comprises thirty deaths in 5,911 cases, 0.51 per cent, 5.1 per 1000 deliveries due to maternity cases; twenty-six deaths in 1272, 2.04 per cent, due to abortion cases; and one death in 46, 2.3 per cent, due to extrauterine pregnancy.

The causes of the thirty maternal deaths are listed in the following table and a brief synopsis of each case appended. There were twenty-six obstetric and four medical deaths in the series. Autopsies were performed on ten fatal cases.

Table 1. Maternal Deaths

| Cause of Death | | No. of Deaths | Percentage |
|---|---|---|---|
| Puerperal sepsis | | 13 | 43.3 |
| Normal deliveries | 6 | | |
| Forceps delivery | 4 | | |
| Breech delivery | 1 | | |
| Outside delivery | 1 | | |
| Manual removal of placenta | 1 | | |
| Eclampsia, convulsive type | | 4 | 13.3 |
| Rupture of uterus | | 2 | 6.7 |
| Placenta previa | | 1 | 3.3 |
| Pernicious vomiting | | 1 | 3.3 |
| Inversion of uterus | | 1 | 3.3 |
| Pulmonary embolism | | 1 | 3.3 |
| Anesthetic death | | 1 | 3.3 |
| Intrapartum hemorrhage | | 1 | 3.3 |
| Surgical shock | | 1 | 3.3 |
| Lobar pneumonia | | 2 | 6.7 |
| Cardiac failure | | 2 | 6.7 |

### CASE SUMMARIES OF MATERNAL DEATHS[1]

### *Puerperal Sepsis. Normal Deliveries*

Case 1. No. 3883. Para-II. Age 22. Died June, 1923. Normal delivery of a living infant, L.O.A. position. Death was due to puerperal sepsis with pelvic peritonitis and pelvic abscess; duration seven weeks. No autopsy.

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[1] These cases are later referred to as M.D. (maternal death.)

Case 2. No. 6176. Para-I. Age 23. Died August, 1923. Normal delivery of a living infant, L.O.A. position. Death was due to puerperal sepsis seventeen days postpartum. Autopsy: general peritonitis, endometritis, thrombophlebitis of both lower extremities, and bilateral pleuritis. Blood culture was positive for hemolytic streptococcus.

Case 3. No. 3244. Para-III. Age 29. Died April, 1924. Normal delivery of a living infant, L.O.A. position, episiotomy. Death occurred on the fifteenth day postpartum from puerperal sepsis and pyelitis. No autopsy.

Case 4. No. 2654. Para-I. Age 19. Died April, 1924. Normal delivery of a living infant, L.O.A. position. Death occurred on the sixth day postpartum from puerperal sepsis and peritonitis with paralytic ileus. Blood culture was positive for hemolytic streptococcus. No autopsy.

Case 5. No. 1105. Para-I. Age 25. Died February, 1925. Normal delivery of a living infant, L.O.A. position. Death occurred on the sixth day postpartum from puerperal sepsis and peritonitis with paralytic ileus. Blood culture was positive for hemolytic streptococcus. No autopsy.

Case 6. No. 4303. Para-I. Age 20. Died June, 1926. Normal delivery of a premature living infant, L.O.A. position. Death occurred on the eighth day postpartum from puerperal sepsis. Autopsy: General suppurative peritonitis and gangrenous endometritis. Blood culture was positive for streptococcus.

### *Puerperal Sepsis.*[2] *Forceps Deliveries*

Case 7. No. 4238. Para-I. Age 34. Died June, 1926. Midforceps delivery of a living infant, L.O.A. position, second degree laceration. Indication for forceps operation was secondary uterine inertia. Retained placenta followed by successful crede expression seven hours after delivery. Death occurred seventeen days postpartum from puerperal sepsis. Autopsy; suppurative pelvic peritonitis and septic endometritis.

Case 8. No. 8785. Para-I. Age 19. Died December, 1926. Midforceps delivery of a living infant, R.O.P. position. Indication for forceps operation was a persistent occiput posterior position. Death occurred eleven days postpartum from puerperal sepsis and general peritonitis. Blood culture was positive for streptococcus. No autopsy.

Case 9. No. 574. Para-I. Age 32. Died January, 1926. Midforceps delivery of a living infant, R.O.P. position. Indication for forceps operation was a deep transverse arrest. Death occurred twenty-one days postpartum from puerperal sepsis. Autopsy: General peritonitis and gangrenous endometritis. Blood culture was positive for streptococcus.

Case 10. No. 537. Para-I. Age 23. Died January, 1927. Midforceps delivery of a living infant, L.O.P. position. Indication for forceps operation was a deep transverse arrest. Death occurred twenty-one days postpartum from puerperal sepsis. Autopsy: Purulent endometritis and cloudy swelling of liver and kidneys.

### *Puerperal Sepsis. Breech Delivery*

Case 11. No. 5292. Para-IV. Age 26. Died July, 1926. Spontaneous breech delivery of premature living infant of seven months gestation, L.S.A. position. Death occurred eight days postpartum from puerperal sepsis. Autopsy: General suppurative peritonitis and bilateral suppurative salpingitis.

### *Puerperal Sepsis. Outside Delivery*

Case 12. No. 2322. Para-III. Age 38. Died March, 1925. (Outside cause.) Spontaneous outside delivery. Admitted to hospital four days later with puerperal sepsis. In hospital 147 days. Cul-de-sac drainage for pelvic abscess. Death due to general sepsis and toxemia. Blood culture positive for streptococcus. No autopsy.

### *Puerperal sepsis. Manual removal of placenta.*

Case 13. No. 4975. Para-I. Age 19. Died July, 1926. Normal delivery of a premature stillborn fetus with maceration, L.O.A. position. A retained placenta developed finally, necessitating manual extraction forty-eight hours later. Death occurred fourteen days postpartum from puerperal sepsis. Autopsy: General peritonitis and septic endometritis.

### *Eclampsia*

Case 14. No. 5555. Para-II. Age 37. Died August, 1926. (Outside cause.) Emergency case. Eclampsia of pregnancy, gestation six and one-half months. Admitted in convulsions with the blood pressure 195/130; albumin four plus and hyaline and granular casts in urine. Induction of labor by means of the Voorhees bag was attempted; the patient died four hours later undelivered. Autopsy: Hemorrhagic necrosis of liver and cloudy swelling of heart, liver and kidneys.

Case 15. No. 1107. Para-I. Age 18. Died February, 1926. (Outside cause.) Emergency case. Eclampsia of pregnancy, gestation seven and one-half months. Admitted in convulsions with the blood pressure 180/130, albumin four plus, and hyaline, waxy and granular casts in the urine. Induction of labor by means of the Voorhees bag, followed by a low forceps delivery of a intrapartum stillborn fetus. Autopsy: Multiple thrombophlebitis of lungs and uterus; sinus thrombosis of lateral, longitudinal, and superior petrosal sinuses.

Case 16. No. 3019. Para-III. Age 41. Died April, 1925. (Outside cause.) Emergency case. Eclampsia of pregnancy, near term. The patient died in convulsions a few hours after admission, undelivered. Autopsy: Hemorrhagic necrosis of liver, cloudy swelling of heart and kidneys, edema of lungs, bilateral hydrothorax.

Case 17. No. 5539. Para-I. Age 40. Died August, 1923. (Outside cause.) Emergency case. Eclampsia of pregnancy; gestation six and one-half months. Admitted in convulsions in comatose condition with the blood pressure 228/122; albumin four plus; anascara. The patient died a few hours later undelivered. Autopsy: Cerebral hemorrhage; edema of lungs; cloudy swelling and passive congestion of heart, liver and kidneys.

### *Placenta Previa. Hemorrhage*

Case 18. No. 900. Para-I. Age 19. Died February, 1924. Case of placenta previa with severe antepartum hemorrhage in the eighth month of gestation. A Voorhees bag induction was followed by the spontaneous delivery of a stillborn fetus. Death occurred eight hours after delivery from postpartum hemorrhage and shock. No autopsy.

### *Pernicious Vomiting*

Case 19. No. 2952. Para-III. Age 28. Died April, 1926. Gestation ten weeks. Pernicious vomiting of four weeks duration on admittance. In hospital nine days. Death due to acute yellow atrophy of liver of eighteen hours duration. No autopsy.

### *Rupture of Uterus*

Case 20. No. 4055. Para-I. Age 24. Died May, 1924. Transverse presentation of fetus. A Vorhees bag induction was instituted followed by an unsuccessful attempt at podalic version. Finally decapitation and extraction became necessary. Death occurred two hours after delivery from surgical shock secondary to a ruptured uterus. No autopsy.

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[2] It is of interest and importance to note that about one-half of the deaths from sepsis occurred during 1926 and four of these took place during the months of June and July within a relatively short period of time.

Case 21. No. 4605. Para-VII. Age 49. Died June, 1924. Prolonged labor with hard pains for twenty-four hours with a large baby and no advancement. A sudden rupture of the uterus occurred followed by shock. A Porro cesarian section was done, obtaining a stillborn fetus. Death occurred one hour postoperative from surgical shock. No autopsy.

### *Inversion of Uterus*

Case 22. No. 3230. Para-I. Age 28. Died April, 1925. Normal delivery of a living infant, R.O.A. position. A spontaneous expulsion of placenta occurred, followed immediately by a complete inversion of the uterus. There was an attempt at replacement by the vaginal route that was only partially successful. Death followed three hours later from surgical shock.

### *Pulmonary Embolism*

Case 23. No. 767. Para-II. Age 25. Died January, 1926. Normal delivery of a living infant, L.O.A. position. Complications of pregnancy were acute rhinitis, pharyngitis and acute right maxillary sinusitis. A sudden death occurred forty-eight hours postpartum from pulmonary embolism. No autopsy.

### *Anesthetic Death*

Case 24. No. 6069. Para-II. Age 23. Died October, 1927. Normal delivery, L.O.A. position. Neonatal death three hours later from asphyxia neonatorum. The patient died four hours after delivery from acute pulmonary edema, secondary to multiple emboli and aspiration of food particles secondary to obstetric delivery with ether anesthesia. No autopsy.

### *Intrapartum Hemorrhage*

Case 25. No. 4884. Para-VII. Age 36. Died June, 1925. (Outside cause.) There had been an unsuccessful attempt at forceps delivery by a private physician through an incompletely dilated cervix. A severe laceration of the cervix and broad ligaments with hemorrhage had occurred; the patient was nearly moribund on admission. She died undelivered four hours after admission from intrapartum hemorrhage with surgical shock. No autopsy.

### *Surgical Shock*

Case 26. No. 8479. Para-I. Age 33. Died November, 1924. Low forceps delivery of a stillborn fetus, episiotomy, L.O.A. position. Surgical shock developed almost immediately after delivery; supportive and intravenous treatment was of no avail. Death followed a few hours later, apparently from surgical shock. No autopsy.

### *Lobar Pneumonia (Medical Causes)*

Case 27. No. 2353. Para-V. Age 32. Died April, 1927. Normal delivery, L.O.A. position. Neonatal death one and one-half hours later from asphyxia neonatorum. Death occurred seven days postpartum from lobar pneumonia of the left upper and lower lobes. No autopsy.

Case 28. No. 4005. Para-IX. Age 42. Died May, 1924. (Outside cause.) Podalic version and extraction of a stillborn fetus with maceration. Death occurred one hour after delivery from lobar pneumonia of five days duration, contracted before admission. No autopsy.

### *Cardiac Failure (Medical Causes)*

Case 29. No. 5223. Para unknown. Age 26. Died July, 1925. (Outside cause.) Spontaneous delivery of a living infant, R.O.A. position. Death occurred twelve days postpartum due to cardiac failure and pulmonary edema, secondary to mitral valvular disease, cardiac hypertrophy and decompensation. No autopsy.

Case 30. No. 3544. Para-III. Age 26. Died May, 1926. (Outside cause.) Spontaneous delivery of a living infant, R.O.A. position. Death twelve days postpartum due to a cardiac failure and pulmonary edema, secondary to mitral valvular disease, cardiac hypertrophy and decompensation. No autopsy.

There were a total of 5,911 delivered mothers cared for in the hospital, of whom, 5,718 or 96.7 per cent were delivered within the hospital. In this group there were 2,002 primiparae (33.8 per cent), and 3,883 multiparae (65.7 per cent). The parity was not recorded in twenty-six cases. Twin pregnancies occurred in 55 instances, one in 107 deliveries, a little less than 1 per cent. Triplets occurred twice, or once in 2,955 cases.

TABLE 2. POSITION AND PRESENTATION

| | Cases | Per cent | Total Cases | Per cent |
|---|---|---|---|---|
| Occiput | | | 5264 | 96.0 |
| L.O.A. | 2951 | 53.8 | | |
| L.O.P. | 129 | 2.3 | | |
| R.O.A. | 1839 | 33.5 | | |
| R.O.P. | 345 | 6.2 | | |
| Breech | | | 187 | 3.4 |
| L.S.A. | 88 | 1.6 | | |
| L.S.P. | 19 | 0.3 | | |
| R.S.A. | 57 | 1.0 | | |
| R.S.P. | 23 | 0.5 | | |
| Face | | | 17 | 0.3 |
| L.M.A. | 8 | 0.15 | | |
| L.M.P. | 0 | 0.0 | | |
| R.M.A. | 4 | 0.07 | | |
| R.M.P. | 5 | 0.08 | | |
| Brow | | | 3 | 0.05 |
| Transverse | | | 16 | 0.25 |
| L.Sc.A. | 7 | 0.11 | | |
| L.Sc.P. | 4 | 0.06 | | |
| R.Sc.A. | 4 | 0.06 | | |
| R.Sc.P. | 1 | 0.02 | | |

## PERINEAL LACERATIONS

First degree perineal injuries are not listed as they occur in the majority of instances, especially in primiparae. There was a second degree laceration in each of 466 cases or 8.7 per cent. An episiotomy was done in 257 instances or 4.2 per cent. A third degree laceration was found fourteen times or 0.24 per cent. Of these, four were present in cases admitted after delivery, which leaves ten in 5,718 cases delivered in the hospital or one in 572 cases or 0.17 per cent. Four of the third degree lacerations followed spontaneous deliveries, three followed face presentations, two followed brow presentations, and one after a version and extraction.

## FORCEPS APPLICATION[3]

Instruments were used in 183 instances, a percentage incidence of 3.3 per cent. The types of operations used were as follows: high forceps 3 cases, midforceps 42 cases, low forceps 120 cases, forceps to the after-coming head 4 cases, and in 14 cases the type of operation was not recorded.

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[3] Approximately eighty per cent of the mid and low forceps operations and episiotomies were done in 1926 and 1927.

TABLE 3. INDICATIONS FOR APPLICATION OF FORCEPS

| Indications[4] | No. of Cases |
|---|---|
| Delay on perineum | 57 |
| Persistent occiput posterior | 22 |
| Transverse arrest of the head | 26 |
| Secondary uterine inertia | 20 |
| Exhaustion of the fetus | 9 |
| Exhaustion of the mother | 5 |
| Arrest of after-coming head | 4 |
| Eclampsia of parturition | 4 |
| Contraction of pelvic outlet | 4 |
| Prophylactic | 4 |
| Postmaturity | 3 |
| Cardiac disease | 2 |
| Pulmonary tuberculosis | 1 |
| Placenta previa | 1 |
| Abruptio placentae | 1 |
| Face presentation | 1 |
| Death of fetus | 1 |
| Both twins | 1 |
| Second of twins | 1 |

The mortality figures for the forceps operations are not very gratifying, but it should be remembered that existing conditions and not the operation per se were most often responsible for the fatalities. There were six maternal deaths (3.3 per cent), following forceps operations. These were due to puerperal sepsis in four cases (M.D. 7, 8, 9, 10), eclampsia one case (M.D. 15), and surgical shock one case (M.D. 26). There were eight stillbirths or 4.3 per cent and six neonatal deaths or 3.2 per cent, a total of fourteen or 7.5 per cent fetal deaths.

### PODALIC VERSION AND EXTRACTION

Podalic version and extraction was performed in 53 instances or 0.93 per cent. The indications follow:

TABLE 4. INDICATIONS FOR VERSION AND EXTRACTION

| Indication[5] | No. of Cases |
|---|---|
| Transverse presentation | 15 |
| Placenta previa | 9 |
| Prolapse of cord | 4 |
| Second of twins | 3 |
| Eclampsia of parturition | 3 |
| Exhaustion of mother | 2 |
| Persistent occiput posterior | 2 |
| Preeclamptic toxemia | 2 |
| Posterior face presentation | 2 |
| Exhaustion of baby | 1 |
| Prolapse of arm | 1 |
| Failure of engagement | 1 |

There were two maternal deaths following version (3.8 per cent), one due to rupture of the uterus (M.D. 20), and the other due to lobar pneumonia (M.D. 28). The fetal mortality following version was exceedingly high but was mainly due to the type of the case encountered and not to the actual operative procedure. There were 24 fetal deaths in all, a total of 45.3 per cent. Three of these (5.7 per cent) were neonatal deaths and twenty-one (39.6 per cent) were stillbirths. However, of the stillbirths five were previable and six were premature just viable. Deducting these eleven cases we would have a corrected stillbirth mortality of 20.4 per cent and a total fetal mortality of 26 per cent.

### CESARIAN SECTION

Cesarian section was performed in only eleven instances or 0.19 per cent. This low incidence can be partially explained by the fact that relatively few foreign women were delivered, the large majority being white native American born women. Contracted pelves were encountered in a surprisingly small number of instances.

The classical cesarian section was performed nine times, the extraperitoneal type once, and the porro-section once. The indications were contracted pelvis in six instances, postmaturity, brow presentation, osteoma of ilium, paralysis of lower extremities from a cord injury, and rupture of the uterus each in one instance. There was one maternal death and one fetal stillbirth following a porro cesarian section for rupture of the uterus (M.D. 21).

Craniotomy was performed five times (0.09 per cent) with no maternal deaths and decapitation was done once (0.02 per cent) with a maternal death (M.D. 20). It was not necessary to perform a pubiotomy or symphysiotomy in any case.

### PLACENTA PREVIA

There were twenty-six cases of placenta previa encountered, a percentage incidence of 0.44 per cent for the entire series. Five of these occurred in primiparae and twenty-one in multiparae. Three were of the centralis, three of the partialis, thirteen of the marginalis type and seven were unclassified. Eleven were at term, seven in the eighth month of gestation. The Voorhees bag was used in eight instances for the induction of labor.

The method of delivery was as follows: spontaneous, twelve cases; podalic version and extraction, nine cases; breech extraction, two cases; undelivered, two cases, and low forceps one case.

There was one maternal death (4 per cent), due to hemorrhage and shock (M.D. 18). There were ten stillbirths and two neonatal deaths, making a total fetal mortality of 46.1 per cent. Abruptio placentae occurred twenty-one times with no maternal deaths.

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[4] Unrecorded, 16 cases.

[5] Unrecorded, 8 cases.

### TOXEMIAS OF PREGNANCY

The convulsive type of eclampsia was present in twenty-nine cases, a percentage incidence of 0.49 per cent for the entire series. This occurred eleven times in primiparae and eighteen times in multiparae. Seventeen cases were at term or in the ninth month of gestation, five were in the eighth, three in the seventh, and four in the sixth month. The antepartum type of eclampsia occurred fifteen times, the intrapartum eight and the postpartum six times. The Voorhees bag was used in eight instances for the induction of labor.

The method of delivery was as follows: spontaneous, sixteen cases; forceps, four; version and extraction, three; outside spontaneous deliveries, three; and died undelivered, three.

There were four maternal deaths, a mortality of 14 per cent (M.D. 14, 15, 16, 17). There were ten stillbirths, three neonatal deaths, and three undelivered fetal deaths, making a total fetal mortality of sixteen or 52 per cent.

Besides the eclampsia cases there occurred ninety-six cases of the preeclamptic type of toxemia with no deaths and forty-four cases of hyperemesis gravidarum with one death (M.D. 19). Therapeutic abortion was performed in only one instance for pernicious vomiting.

### FEBRILE PUERPERUM

The postpartum convalescence was classified as febrile, if there was a rise of temperature to 100.4° on any two consecutive postpartum days. In this series febrile puerperums occurred in 491 cases or 8.5 per cent.

### MANUAL REMOVAL OF PLACENTA

Manual removal of placenta was necessary in twenty-two instances with one maternal death from sepsis (M.D. 13).

### CHOREA GRAVIDARUM[6]

There was one case of chorea gravidarum in the fifth month of pregnancy, successfully treated with repeated intravenous injections of blood serum from normal pregnant women. Recovery ensued and a full term normal baby was later delivered.

### FETAL MORTALITY

The fetal and early infant mortality was 7.7 per cent or 77 per 1000 births. This included 284 neonatal deaths or 4.8 per cent and 172 stillbirths or 2.9 per cent. Of the 172 stillbirths, 142 or 82.6 per cent were autopsied.[7] The causes of death for those autopsied are shown in the following table:

Table 5. Pathologic Causes of Stillbirths (Autopsy)

| Cause of death | | Number of cases |
|---|---|---|
| Prematurity | | 47 |
| Viable | 30 | |
| Previable | 17 | |
| Asphyxia neonatorum | | 30 |
| Antepartum | 12 | |
| Intrapartum | 12 | |
| Postpartum | 6 | |
| Birth trauma | | 12 |
| Congenital syphilis | | 15 |
| Monsters | | 14 |
| Anencephalus | 8 | |
| Exencephalus | 1 | |
| Meningoencephalocele | 1 | |
| Hydrops fetus universalis | 1 | |
| Malformed fetus | 3 | |
| Perforated wounds of head (craniotomy) | | 5 |
| Died undelivered | | 4 |
| Congenital hyperthyroidism | | 1 |
| Maceration: Cause uncertain | | 14 |

In addition to these pathologic causes for deaths, the following contributing causes were present during pregnancy or labor in the series of stillbirths which were autopsied.

Table 6

| | | Number of cases |
|---|---|---|
| A. Toxemia of pregnancy | | 22 |
| Convulsive | 10 | |
| Nonconvulsive | 12 | |
| A. Complete miscarriages | | 12 |
| A. Missed miscarriages | | 2 |
| C. Placenta previa | | 10 |
| C. Abruptio placentae | | 5 |
| A. Difficult breech extraction | | 4 |
| A. Difficult version and extraction | | 3 |
| A. Difficult forceps delivery | | 3 |
| C. Cord about neck | | 2 |
| C. Prolapse of funis | | 6 |
| C. Knot in funis | | 1 |
| A. Acute bilateral pyelitis | | 1 |
| A. Diabetic acidosis | | 1 |
| B. Second of twins | | 1 |
| B. Third of triplets | | 1 |
| A. Rupture of uterus | | 1 |
| B. Craniotomy | | 5 |
| Failed version and extraction | 2 | |
| Failed high forceps | 1 | |
| Failed forceps to after coming head | 1 | |
| Compound presentation | 1 | |

A. Maternal causes.
B. Fetal causes.
C. Placenta and cord.

### CAUSES

There were 284 neonatal deaths, 4.8 per cent for the entire series. Of these 128 cases, 45.4 per cent were autopsied. Of the autopsied babies, 77 or 60.2 per cent died within the first twenty-four hours following birth, and 51 or 39.8 per cent died from the second to the fourteenth day after birth. Of the autopsied babies fifteen were premature previable, seventy-five were premature viable, thirty-four were mature and four were postmature.

The pathologic causes of all neonatal deaths are shown in the following table:

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[6] Sichel, M. S.: Chorea of Pregnancy, Minn. Med., 9:213, 1926.

[7] From the Department of Obstetrics and Pathology of the University of Minnesota from F. L. Adair's series of fetal and newly born autopsies.

TABLE 7. PATHOLOGIC CAUSES OF NEONATAL DEATHS

| Cause of death | Autopsy Performed | No Autopsy Performed | Total |
|---|---|---|---|
| Prematurity | | | 174 |
| Viable 57 | 102 | | |
| Previable 15 | | | |
| Birth trauma | 20 | 5 | 25 |
| Asphyxia neonatorum | 5 | 7 | 12 |
| Infections | | | 39 |
| Bronchopneumonia | 9 | 12 | |
| Hemorrhagic disease of newborn | 3 | 0 | |
| Acute peritonitis, fibrinopurulent | 2 | 5 | |
| Acute meningitis, fibrinopurulent | 1 | 1 | |
| Acute pancreatitis | 1 | 0 | |
| Acute ileocolitis | 1 | 0 | |
| Erysipelas | 0 | 4 | |
| Congenital diseases and malformations | | | 17 |
| Congenital syphilis | 3 | 1 | |
| Congenital heart disease | 2 | 2 | |
| Hyperthyroidism | 1 | 0 | |
| Congenital occlusion of colon | 1 | 0 | |
| Congenital atelectasis | 0 | 3 | |
| Congenital nephritis | 0 | 3 | |
| Congenital pyloric stenosis | 0 | 1 | |
| Status thymus lymphaticus | 0 | 1 | |
| Monsters | | | 7 |
| Diaphragmatic hernia | 2 | 0 | |
| Fetal ascites | 1 | 0 | |
| Malformed fetus | 1 | 0 | |
| Hydrocephalus | 1 | 1 | |
| Meningoencephalocele | 0 | 1 | |
| Icterus neonatorum | 1 | 0 | 1 |
| Vaccinia | 0 | 1 | 1 |
| Malnutrition[8] | 1 | 7 | 8 |

## ABORTION CASES

Of the 1272 abortions cared for during this five year period there were twenty-six deaths (2.04 per cent). Of the fatal cases, seventeen were induced either criminally or self-induced, and four were spontaneous. None of these cases was subjected to curretage in the hospital. Autopsy was performed on twelve of the patients dying from sepsis. Seven of the fatal cases were emergencies, being in the hospital only a few hours; five were in the hospital less than forty-eight hours.

The following table shows the cause of death of the fatal abortion cases.

TABLE 8

| Cause of death | | Cases | Percentage |
|---|---|---|---|
| Sepsis | | 22 | 84.6 |
| General peritonitis and septic endometritis | 16 | | |
| General peritonitis and bronchopneumonia | 2 | | |
| General peritonitis and acute salpingitis | 1 | | |
| Septic endometritis and lung abscess | 1 | | |
| Pelvic abscess | 1 | | |
| Empyema | 1 | | |
| Hemorrhage | | 1 | 3.8 |
| Lobar pneumonia | | 1 | 3.8 |
| Bronchopneumonia | | 1 | 3.8 |
| Variola hemorrhagica | | 1 | 3.8 |

The patient dying of hemorrhage was an emergency case, admitted in an exsanguinated condition following a self-induced abortion. Cardiac stimulation, heat and intravenous therapy were immediately instituted. Death occurred despite these measures a few hours after admission from acute anemia before a blood transfusion could be arranged for.

## SUMMARY

1. A statistical survey of 7,226 obstetric cases, occuring during a five year period at the Minneapolis General Hospital, is presented.

2. There were 5,911 maternity cases in the series with thirty deaths, a mortality of 0.51 per cent. Puerperal sepsis was responsible for 43.3 per cent of these deaths.

3. There were 1272 abortion cases with twenty-six deaths, a mortality of 2.04 per cent. Sepsis was responsible for 84.6 per cent of these deaths.

4. There were 46 extrauterine pregnancies with one death, a mortality of 2.3 per cent.

5. There were 5,483 recorded fetal presentations, with the occiput presenting in 96 per cent, the breech in 3.4 per cent, the face in 0.3 per cent, the brow in 0.05 per cent, and the shoulder in 0.25 per cent.

6. Second degree perineal lacerations occurred in 8.7 per cent and third degree in 0.24 per cent of the series. Episiotomy was performed in 4.2 per cent.

7. Forceps were applied in 3.3 per cent of the series with a maternal mortality of 3.3 per cent and a fetal mortality of 7.5 per cent.

8. Podalic version and extraction was performed in 0.93 per cent with a maternal mortality of 3.8 per cent and a fetal mortality of 45.3 per cent.

9. There were twenty-six cases of placenta previa treated, with a maternal mortality of 4 per cent and a fetal mortality of 46.1 per cent.

10. There were twenty-nine cases of convulsive eclampsia treated, with a maternal mortality of 14 per cent and a fetal mortality of 52 per cent.

11. The entire fetal mortality was 7.7 per cent. Of these 2.9 per cent represented still births and 4.8 per cent were neonatal deaths. By subtracting the seventeen previable still births and the fifteen previable neonatal deaths, a corrected mortality rate of 2.6 per cent for the still births and 4.5 per cent for the neonatal deaths is obtained, making a total corrected fetal mortality rate of 7.1 per cent.

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[8] Alimentary intoxication, malnutrition, marasmus, inanition fever, dehydration.

# AMERICA'S HIGH MATERNAL MORTALITY RATE

Frank L. Wood, M.D.
LYNDEN, WASH.

After practicing obstetrics as a general practitioner for twenty-six years without any maternal mortality due to obstetric causes and with very little morbidity of a serious nature, and after observing the methods, technic and results of many other general practitioners, surgeons and specialists in the practice of obstetrics, I have come to certain definite conclusions as to the causes of most of our maternal mortality and morbidity. Believing that the vast majority of American physicians are intelligent and competent, I am compelled to conclude that the reason for their failure in this work must be charged to a lack of that third and most important requisite or attribute, conscientiousness.

It is true that our mortality rate from septicemia is even higher than it is reported to be because many deaths are reported due to other causes. This is done wilfully because physicians do not like to admit that their patients die from this cause. General practitioners need to improve their results but I very seriously doubt if their general results are any worse than those of surgeons and specialists who do this work. There are two reasons for this. The general practitioner as a rule does not consider his time as valuable as does the surgeon or specialist, and is apt to give the patient more time and attention. As he usually employs an antiseptic rather than an aseptic technic, he more readily adapts himself to the protection of his patient when he has to attend her in unsanitary surroundings. I have no statistics available but from my own observation I am of the opinion that there has been fully as great an improvement in the mortality rate outside of hospitals as has occurred in hospital practice.

If anyone will take the trouble to investigate the actual results of individual physicians, he will sometimes be astounded by their differences. He will find that of two physicians practicing side by side over a period of years, one will have a mortality rate of eight or ten per thousand, while the other's will be nil. He may find that, while the morbidity rate of one will be twenty or more per thousand, that of the other will be almost negligible. When their individual experience covers over one thousand cases and they are of about equal intelligence, training and ability, as is often the case, this difference in results cannot be charged to lack of ability or luck.

What, then, is the cause of this difference in results? In my opinion it can mostly be charged to a difference in the exercise of personal conscience. If the physician is conscientious and permits his acts to be governed by the golden rule or the oath of Aesculapius, his results cannot be very bad. I hold this to be more important than special ability, training or experience, for if he has ordinary ability and is conscientious, he will not attempt to do those things which he knows he is not competent to do, but will seek assistance, but if he is not conscientious he will be careless, hasty or indifferent, or employ measures to suit his own comfort and convenience which may be inimical to the safety of mother or child.

Next in importance is antiseptic technic. Aseptic technic in obstetrics is a delusion and a snare. This should be apparent to anyone because of the obvious impossibility of sterilizing the urethra, the anal region and the birth canal itself. While the bowel should be washed out if there is time before the second stage of labor, and the patient should be scrubbed not only with soap and water but with lysol solution, she should not be considered sterile, and every time the birth canal is entered for any reason, a fresh pair of sterile gloves should be used or the gloves worn should be sterilized on the hands by washing in pure lysol and rinsing. I use the latter method, since it is much simpler outside of hospitals and is much less apt to be neglected when in an emergency. I have adopted this technic because it is much safer to have it definite and always employ it. The common practice of sterilizing the gloves once by boiling, and after contaminating them by contact with the field of operations, merely rinsing them in a weak lysol solution before further examinations or manipulations is reprehensible, and is doubtless the cause of many infections, for some part of the gloved hand usually comes in contact with the skin of the patient, particularly of the anal region, and this contamination cannot readily be removed by mere rinsing.

In over one thousand consecutive obstetric cases I have signed three death certificates following childbirth. Two were influenzal pneumonia cases who died within an hour after the birth of premature infants. These deaths both occurred during the great epidemic of 1918-19. The other was a case of puerperal eclampsia in a christian scientist, to whom I was called prior to death so that I might sign the death certificate. None of these thousand cases was attended in a hospital. Only a dozen or less had the services of a trained nurse. The remainder were cared for by members of the family, neighbors or so-called practical nurses. In two cases of central placenta previa I had no assistant except the husband. Many were in very unsanitary, even filthy surroundings, but by practicing the same antiseptic technic in every case, regardless of the apparent filth or cleanliness of the patients, my cases of infection of any kind were extremely rare and unimportant. I have not hesitated to dilate the cervix manually, perform version, apply forceps, and in two instances dissect away firmly adherent placentae manually, regardless of the surroundings. The only case of phlegmasia alba dolens I encountered was in a patient whose child was presenting when I arrived and in whom no examinations were made. Furthermore, her surroundings and her person were sanitary. I cannot recall that I ever had any infection whatever in any of those numerous cases wherein forceps or other intrauterine manipulations were employed.

I have little faith in the normal aseptic condition of the birth canal. It always seemed to me that having my gloves always wet with a strong lysol solution made internal manipulations a benefit rather than a danger, yet I have made it a point not to interfere any more than is necessary to insure normal progress. Too many physicians are afraid to interfere from fear of sepsis, and permit their patients to suffer needlessly in the first stage of labor, when a very little assistance on their part would shorten labor many hours and relieve the patient of much suffering. The common practice of examining the patient at the beginning of labor and then leaving her to suffer for many hours without any attention or assistance on the part of the physician is heartless, to say the least. This cannot be done in the home, as the patient will not permit it, but once the physician gets his patient into a hospital she is impressed by the nurse with the idea that everything is being done for her that can be done, and so she suffers in patience or otherwise according to her nature. I have been informed of cases where the attending physician instructed the nurse to make rectal examinations to determine the progress of the case in order that he might not be called until the last minute. Some have complained that these examinations made by the nurse were more painful than the pains of childbirth, yet they had to endure them, believing that since they were in a hospital and under the care of a trained nurse, they were getting the best of care.

This neglect on the part of the physician to personally assist his patient through the most painful part of the first stage of labor and the whole of the second stage is one of the most crying evils in the practice of obstetrics today. If he has not the time or the patience to do this, he should not practice obstetrics. If every physician would perform this duty, treat every patient as conscientiously as he would his own wife or daughter, adopt a definite antiseptic technic and employ it in every case regardless of her surroundings, the maternal mortality rate in obstetrics would not be a disgrace to the American medical profession. Unless something is done about it by the profession except to propound a lot of fool theories and lay the blame on lack of nursing and lack of hospitalization, which have nothing to do with the matter, I seriously fear that we are going to be annoyed by continued meddling by Congress in this matter.

We cannot shirk our duties to these cases forever and get away with it. Nurses are a valuable aid to physicians but they are not physicians, obstetricians nor qualified anesthetists, and when we permit or require them to act as such without our personal supervision, we are taking chances with human life and subjecting ourselves to criticism. Nurses should not be required to administer anesthetics or make obstetric examinations except under the personal supervision of the physician. They should not be instructed to delay until the last minute before calling the physician just before the baby is born. He should be present throughout this stage. Nurses have often told me they had been severely scolded by physicians because they had been called too soon and had been obliged to wait a short time for the birth of the child.

*Anesthesia.* Various methods have been devised to relieve the pangs of childbirth, but in my opinion nothing has been suggested that is as safe and effective as chloroform and ether, administered by inhalation by the physician himself or under his direct supervision, chloroform for partial anesthesia during the pains, and ether for deep anesthesia during version, forceps, etc. Morphine in any combination in obstetrics may be injurious. I think most physicians realize this. It may delay labor seriously and through this delay and its effect upon the child result in its death or injury. I have known cases to be delayed for forty-eight hours that should have been completed in eight or ten hours. For these reasons H.M.C. and other combinations of morphine, once so popular with a portion of the profession, have been largely abandoned.

More recently rectal anesthesia has been adopted by many and has been commercialized by the drug houses. I see no object in this method as far as the patient is concerned, but there are many objections to its use. If the physician wishes to neglect his patient during the painful part of the first stage and through the second stage of labor and yet does not wish to see her suffer, he may temporize with this method. This is, however, not rational or scientific. If all patients were alike, if the duration of labor, the severity of the pains, the force of contractions, the susceptibility of the patient to ether and the retention of the ether-oil mixture were the same in all cases, then the method could be used more successfully, if the physician personally observed the patient during the period of anesthesia. But no two patients are the same in any of these respects, and a dose of ether insufficient to give much relief to one patient might be sufficient to cause deep anesthesia in another. As long as ether is being absorbed from the ether-oil mixture, an anesthetic is being administered and I firmly believe that any physician who relinquishes his privilege and duty of administering anesthetics, and turns this responsibility over to a nurse in his absence, subjects himself to just criticism.

If, then, the physician personally supervises the administration of the anesthetic, as he should, he may as well administer it by inhalation, a much simpler and better way, except in rare instances, for he then has the anesthetic under his control at all times. If the child's shoulders are large and extraction is difficult and the mother is deeply anesthetized so that she cannot assist in its expulsion, it may be asphyxiated. Another disadvantage of the ether-oil mixture is that anesthesia frequently interferes with the uterine contractions so that little or no progress is made while the patient is partly or fully anesthetized. Thus the patient may lie for hours without making any appreciable progress while the ether is being absorbed. The addition of quinine to the mixture is of questionable value in overcoming this difficulty, as many of us found out before the introduction of pituitrin. When the anesthetic is given by inhalation it can be discontinued until the contractions become strong again, but with rectal anesthesia this is difficult or impossible.

Forceps are a great boon to maternity, if properly and conscientiously used. There is considerably more danger of lacerations with forceps than without. Therefore, they should not be employed even by those most expert in their use except when necessary. The expert use of forceps involves manual dexterity, considerable mechanical ingenuity and a hand that is not too broad, short or clumsy. Some physicians have great difficulty in applying the blades properly and are potentially dangerous. Others do not understand the pelvic curve nor how much to incline the handles as the head advances.

The use of axis-traction forceps a few times is a great educator in this respect. Some authorities condemn this type of forceps, but it always seemed to me there were fewer potentialities of harm in them than in the ordinary forceps. After using them one realizes how hard it is to maintain the proper inclination of the handles of ordinary forceps while exerting hard traction. Since the improvement in surgical technic, the lowered mortality rate in cesarian section, the advent of the automobile and improved hospital facilities, there is not the imperative need of difficult forceps deliveries that there was a few years ago. I have delivered many cases by means of the axis-traction that I feel sure I could not have delivered by ordinary forceps, and with little damage to mother and child and withal I believe the mothers were safer under this method than they would have been under recent cesarian section technic.

In the series referred to there was only one delivery by cesarian section and that was for central placenta previa. Since this method has become comparatively safe, I fear it is being resorted to altogether too frequently. Surgeons and specialists are inclined to favor this method because it is more profitable, is more rapid, and is more scientific. It appeals to their fancy in every way but I doubt very much if it is as safe as forceps except in a very few cases. When one can attend one thousand cases without resorting to it once for contracted pelvis, and without maternal mortality or morbidity from this cause, it does not seem to me that its employment is frequently demanded.

Pituitrin has been a great help to me and my patients. Used conscientiously it has frequently shortened the duration of labor many hours and made the use of forceps unnecessary. After using this remedy in hundreds of cases I am able to say I have never observed any untoward effects from its use except that the first dose I administered after its introduction was too large and caused a severe tetanic contraction which lasted until the child was born. The patient was a multipara with roomy pelvis and no harm was done. The dose at first recommended was one cubic centimeter which was much too large, and after that first dose I have never given an initial dose to exceed three minims. This is usually sufficient and has never in my experience caused contractions of greater violence, duration or frequency than good normal contractions.

We still find some physicians who recommend a full c.c. dose, but I feel certain that this dose is dangerous. There are others who claim that it is dangerous in any dose. This may be true, if one does not observe the contraindications to its use. No doubt harm has been done by this useful remedy, but if used conscientiously and intelligently it canont do more harm in my opinion than ordinary normal labor pains. It is a wise precaution to give one-half c.c. of this agent as soon as the head is born, particularly in forceps cases and when the patient is deeply anesthetized. This facilitates delivery of the shoulders and prevents immediate postpartum hemorrhage until the ergot, given at the completion of the second stage, has had time to take effect.

If this procedure is always carried out, hemorrhage as an important cause of maternal mortality will be practically entirely eliminated. Occasionally a hemorrhage due to rupture of a varicose vein somewhere below the cervix will need special attention but this has occurred only once in my experience. There may be an occasional case of postpartum hemorrhage that canont be controlled by pituitrin or pressure on the fundus. In those cases I have employed a procedure recommended by Dr. McDermid of the University of Illinois. It consists in saturating some gauze or other sterile material with common household vinegar and applying it to the fundus with the sterile gloved hand. The hand alone will usually cause sufficient contraction, if the vinegar is not immediately available, and at the same time it can search for and remove portions of placenta or membranes which may be the cause of the hemorrhage. The important thing is not to wait too long before doing this. If one observes these precautions and remains with his patient until all ordinary danger of hemorrhage is over, this as a cause of maternal mortality will be practically eliminated.

Together with lack of nursing and lack of hospitalization, the other reason commonly given for our high mortality rate is lack of prenatal care. While this is often essential to the comfort and safety of the mother, the lack of it does not actually cause very many deaths in my observation, although it does cause considerable avoidable morbidity. The reason for this is that most women will call or consult a physician reasonably soon after symptoms of trouble manifest themselves. I do not deprecate prenatal care but I believe that if some of those physicians who impress their patients with their deep interest in their cases by having them come to their offices for frequent examinations, many of which are unnecessary, and a disagreeable nuisance and waste of time to the patients, would give them more real service at the time of labor instead, they would have better results. If they would have more consideration for the comfort and safety of their patients, as well as the expense they cause them, and would be less concerned about their own time, convenience and profit, we would have fewer motherless families and childless mothers.

### SUMMARY

Our high mortality rate is not due to lack of expert nursing, lack of hospitalization or lack of prenatal care, for many physicians who are denied the advantages of trained nurses and hospitals, and whose patients cannot be induced to accept prenatal care to any extent, are having a mortality rate that is negligible.

Our high mortality rate is due to haste, neglect and indifference on the part of individual physicians, and to the adoption of a technic not adapted to the nature of the case or its surroundings. The mortality rate of the individual physician depends more upon the time, care and attention which he gives to his patient at the time of her delivery than it does upon special training or any other factor. There is not enough personal nonsurgical assistance rendered the patient by her physician and often too much surgery.

Nurses should not be permitted to administer anesthetics, including rectal, except under the direct supervision of the physician. They should not be permitted or required to make examinations.

The physician should be present during the painful part of the first stage of labor and throughout the whole of the second stage. Besides relieving the pain safely, he can often render valuable assistance and shorten labor many hours. If he has not the time to render this service, he should accept fewer cases or engage an assistant physician.

The incidental expenses of childbirth are often too high for the average middle-class patient, and are an important cause of race suicide. These expenses can easily be reduced, if the physician will adapt himself to the circumstances of the patient and give her the personal services that he should, but which he often relegates to others.

# THE TREATMENT OF SALPINGITIS

## WITH SPECIAL EMPHASIS ON THE BELL-BEUTTNER OPERATION *

Albert Mathieu, M.D., F.A.C.S.
PORTLAND, ORE.

It would be obviously unkind for me to hold you while I tried to cover the entire subject of salpingitis. I have, therefore, selected a few telegraphic statements which bring out the high lights of the subject and lead up to a description of the Bell-Beuttner operation.

Blair Bell has aptly said, "In ascending infections of the female genital tract, lesions may be produced throughout, from the external genitals to the pelvic peritoneum, and the character of these depends not only on the organism responsible for them but also on the time of infection, especially in relation to the menses, pregnancy and the puerperium and on the general resistance of the patient."

Five per cent of tubal infections are due to the tubercle bacillus, eighty per cent to the gonococcus and fifteen per cent to other bacteria. Tuberculous salpingitis is usually a part of a general tuberculous infection. Salpingitis, due to the streptococcus, staphylococcus or colon bacillus, is usually the result of instrumentation associated with pregnancy. Gonorrheal salpingitis is always preceded by intralabial infection. The stigmata of gonorrheal infection are the history, frequency and burning on urination, discharge, Skene and Bartholin gland infection and positive smears. Tuberculous tubes are usually diagnosed only in the laboratory, while the history is the big factor in the diagnosis of other infections (abortion, instrumentation, etc.).

Tuberculous tubes are slow to cause symptoms and there is usually a history of tuberculosis elsewhere in the body. The tubes are hard, nodular, and often exhibit tubercles on their peritoneal surfaces. There is little tendency towards abscess formation and the adhesions are extremely dense and firm. The tubes frequently contain a cheesy, caseous material and free fluid is often seen in the abdominal cavity.

Staphylococcic, streptococcic or B. coli salpingitis is usually associated with pelvic cellulitis, perimetritis and oophoritis. The adhesions are dense and firm but not to the same extent as in tuberculosis. Exacerbations are not the rule. Pelvic abscess is most common.

Gonorrheal tubes, when acute, have open fimbriated extremities with the purulent process extending into the abdominal cavity, causing pelvic peritonitis. There is a definite tendency towards recovery, interrupted at times by periods of so-called exacerbations. Later there is closure and sealing of the fimbriated extremities. Tuboovarian abscesses frequently result. Often hydrosalpinges ensue.

The treatment of chronic tuberculous salpingitis is always surgical, while staphylococcic, streptococcic, or B. coli salpingitis should be treated expectantly by rest and a hygienic regime. Diathermy, foreign protein or milk injections may be

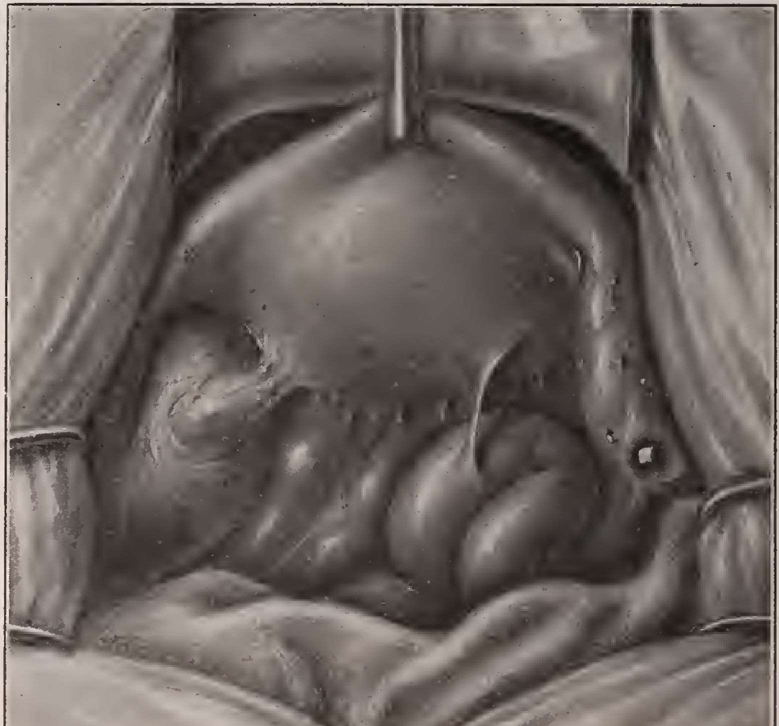

Fig. 1. After the abdomen has been opened, the fundus of the uterus is grasped high up by a volsella forcep so as to reveal the adhesions which are usually present between the uterus, tubes, ovaries and intestines. These are relieved and special care is taken not to injure the bowel. Then, starting deep in the pelvis, the adhesions of ovaries and tubes to the broad ligaments are separated from below upwards. A line of cleavage is usually easily found and the separation as a rule is not difficult.

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* From the Gynecological Service, Multnomah Hospital and the Gynecological Department of the University of Oregon Medical School.

* Read by invitation before the Southern Oregon Medical Association, Medford, Ore., May 13, 1930.

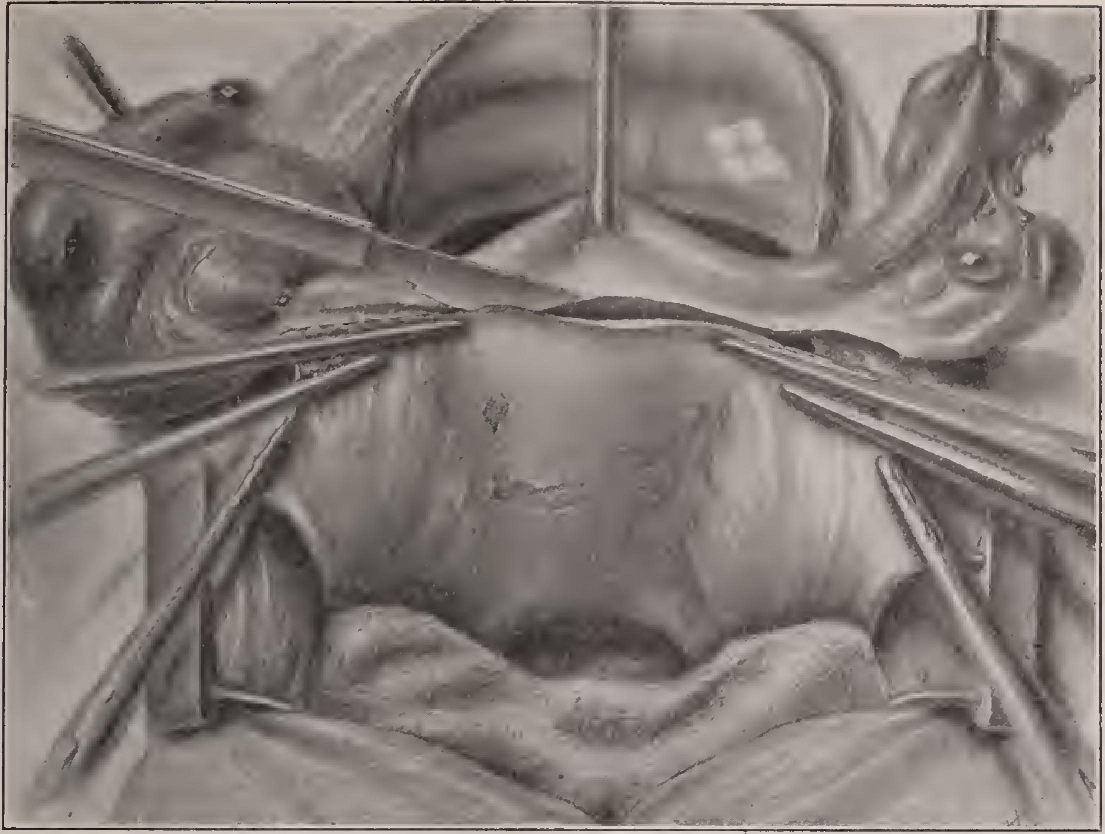

Fig. 2 The infundibulopelvic and the broad ligaments, including a small portion of the uterus, are clamped off on each side. The tubes and ovaries are separated from these attachments by the knife and then an incision is made in the posterior wall of the fundus which includes the cornual ends of both tubes. The blade is pointed at about an angle of 90° with the perpendicular axis of the uterus and the incision extends diagonally through the uterine wall to the endometrium.

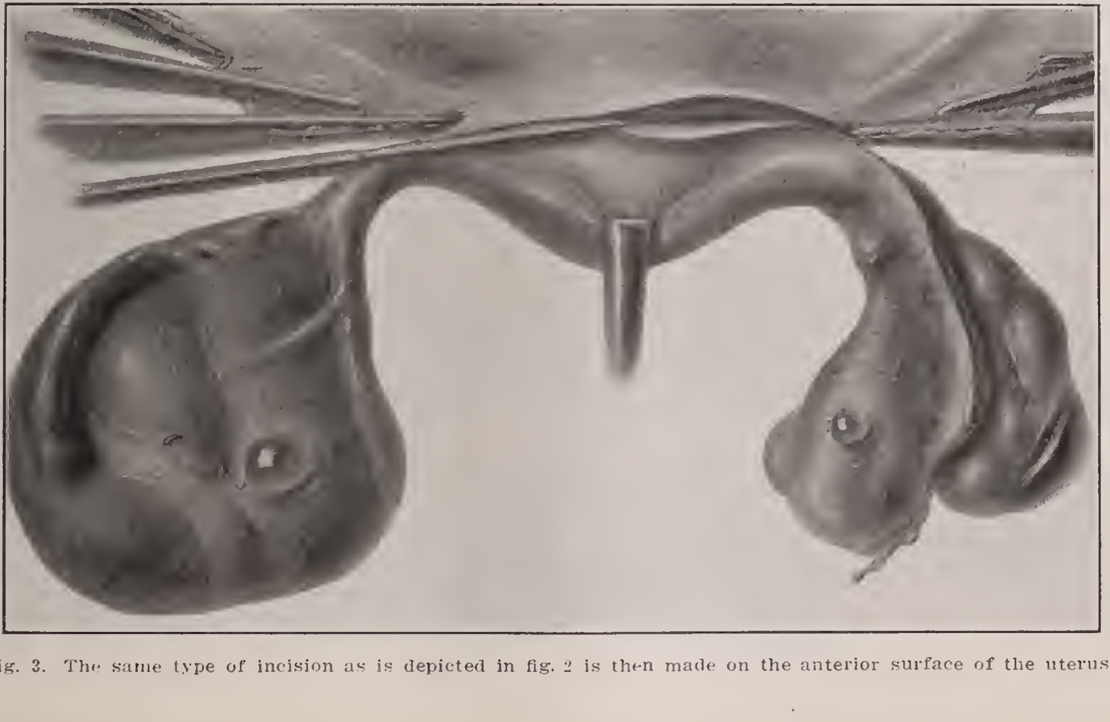

Fig. 3. The same type of incision as is depicted in fig. 2 is then made on the anterior surface of the uterus.

used to advantage. Colpotomy and drainage relieve pelvic abscess. The other sequelae are treated surgically.

Gonorrheal salpingitis is a self-limiting disease. Hence the most important point in treatment is removal of the consort, because the so-called exacerbations of gonorrheal salpingitis are *always* reinfections.

Rest, pelvic diathermy and injections of foreign protein may be used to advantage. Removal of all foci of infection by cauterization of Skene's glands and excision of Bartholin's glands, cauterization of the infected cervix and colpotomy with drainage of pelvic abscess are the important steps in treatment.

Douches, regardless of vividness of color or fantastic formulae, are of no value whatever. Instead they are injurious. *Notwithstanding the fact that operations for salpingitis are done only for the sequelae, there is a class of patients who, in my opinion, under the present social standards, should be operated on. These are the avowed idiots, derelicts, prostitutes and those unable physically, financially, mentally or morally either to cope with the condition or to follow advice. This, in my mind, is important for these people are rarely cured by medical means and are a constant economic burden to themselves and to the community.*

It is an essential condition that the infection be in the chronic stage at the time of the operation, and by adhering to this rule the morbidity and mortality will be kept at a minimum. Operation is *never* done in the acute or subacute stage and is done only for the sequelae which occur in about 15 per cent of all the cases. The sequelae are pain in the pelvis, dyspareunia, dysmenorrhea, other menstrual disorders, adherent retroflexion, generalized adhesions, hydrosalpinx and cystic ovaries.

The laboratory and clinical signs of chronicity are the temperature, leukocyte count and the sedimentation distance. The patient should be fever-free for at least two weeks. The leucocyte count and the sedimentation distance should be within normal limits. It is a well known fact that the sedimentation distance test is more delicate than

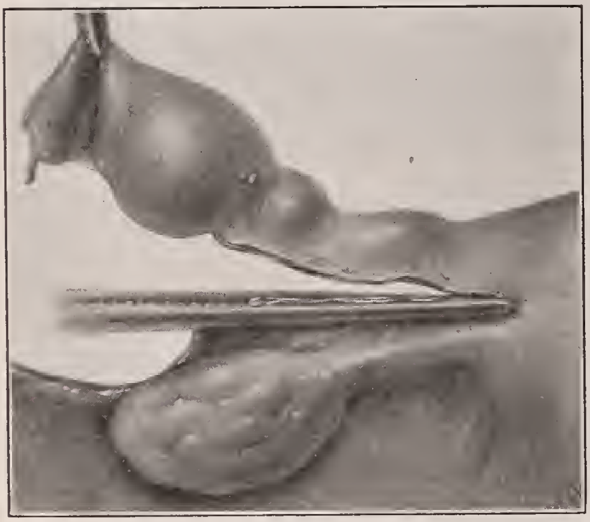

Fig. 4. When the ovary can be conserved, the infundibulopelvic ligament is not clamped but the mesosalpinx is clamped as shown above. This maneuver leaves sufficient circulation to nourish the ovary.

Fig. 6. The closure of the incised area is depicted in seven stages: (a) the closure of the uterine wound; (b) a running suture in the broad and infundibulopelvic ligaments; (c) and (d) the fastening of the stumps of the broad and infundibulopelvic ligaments to the uterine fundus and (e) and (f) a modified Coffey plication of the round ligaments which extends on to the back of the uterine body so as to hold the uterus in an anterior position and (g) to peritonealize the entire incisional area, leaving no raw surfaces.

Fig. 7. This series of drawings shows the technic for transplanting ovarian tissue (figs. a to f). A portion of healthy ovarian tissue is cut off the ovary, macerated by gridiron incisions with a sharp knife so as greatly to increase its surface area, the making of a small pocket in the subcutaneous fat at the lower end of the incision (it is very essential that this pocket be dry) and the placing of the ovarian graft in the pocket. It is obvious that the sutures which close the abdominal wound should impinge in no way on the ovarian graft or its pocket.

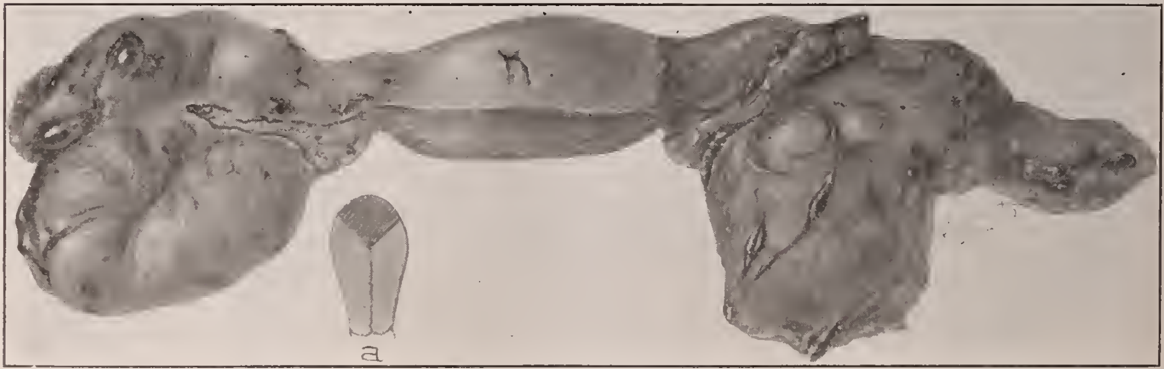

Fig. 5. This drawing shows the tissue removed. In this case the specimen includes both tubes, both ovaries and the wedge shaped piece of the fundus includes the cornual ends of the tubes. Fig. (a) is a schematic drawing showing the wedge excised in the Bell-Beuttner operation.

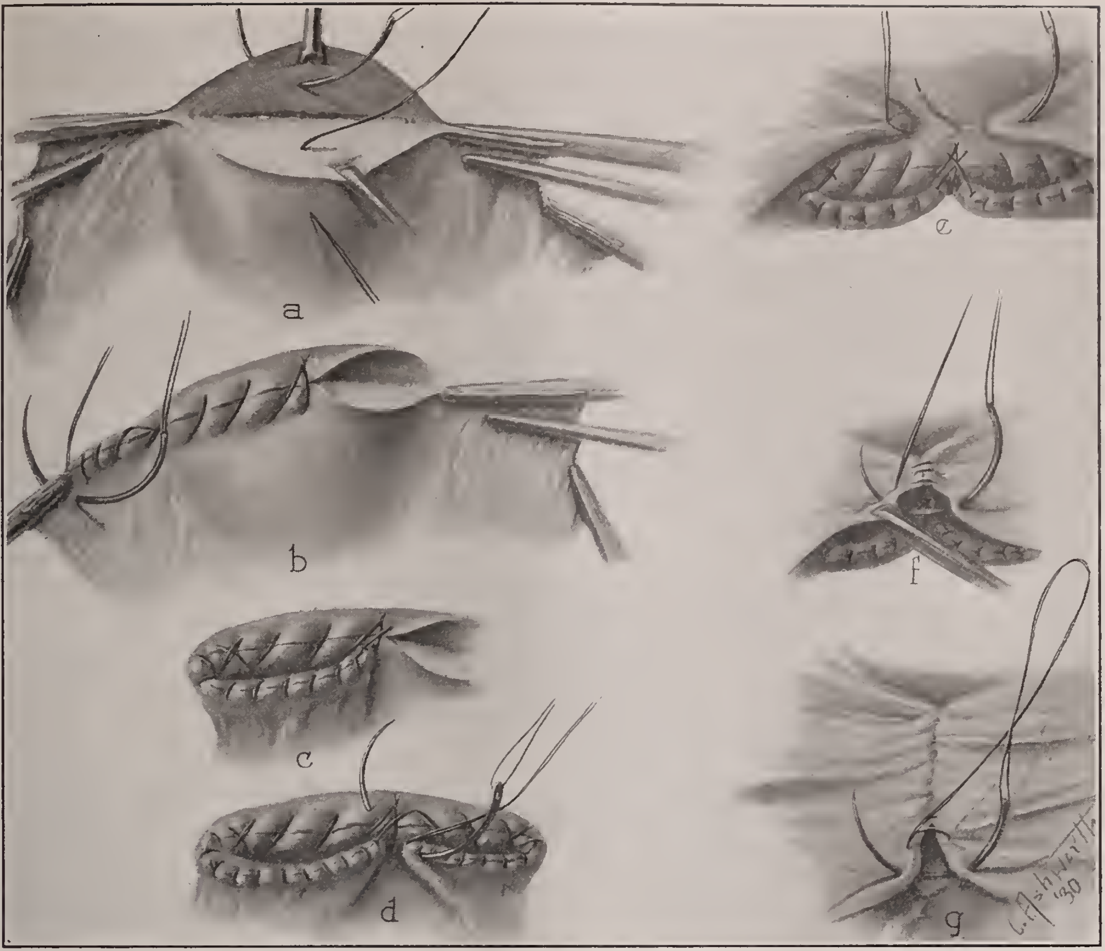

Fig. 6.

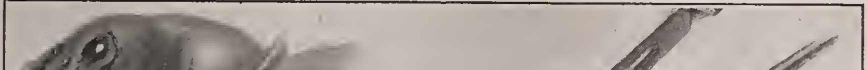

Fig. 7.

the leucocyte count in these matters.

There is often the question as to sterility. This point may be the deciding factor in determining whether or not to operate. Here the use of iodized oils injected into the uterus and tubes and visualized with the roentgenray will determine accurately the condition of the tubes as regards the possibility of future pregnancy. "The preservation of the general functions in the female, even though conception be impossible, is a surgical ideal which we should strive to attain, whenever operations on the female genitalia may be necessary. When it is possible in a woman under forty years old, an ovarian graft should be made, if both ovaries are removed from their normal connections" (Bell).

The inflammatory lesions, for which the Bell-Beuttner (figs. 1, 2, 3, 4, 5, 6, 7) operation is indicated, are those which cause irreparable damage to the tubes and possibly the ovaries, and affect the fundus uteri. Such lesions are chiefly produced by the gonococcus.

The type of operation performed by me in 100 consecutive cases from 1922 to 1930 is as follows:

| | |
|---|---|
| Supravaginal hysterectomy with | |
| Both tubes | 2 |
| Both tubes and both ovaries | 4 |
| Both tubes and on ovary | 9 |
| Bell-Beuttner operations* with | |
| Both tubes | 2 |
| Both tubes and both ovaries | 23 |
| Both tubes and one ovary | 45 |
| Both tubes, both ovaries and ovarian transplant | 15 |
| Total | 100 |
| Results | |
| Average postoperative days in hospital | 21 |
| Morbidity (B. M. A.) per cent | 22 |
| Mortality | 0 |

The follow-up has been difficult and incomplete. Several patients in private practice are still menstruating more or less regularly after three and four years following the grafting of ovarian tissue.

545 Medical Arts Building.

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* Slight modifications of the original operations of both Bell and Beuttner will be noticed.

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CLINICAL SYNDROMES THAT INCLUDE ACHLORHYDRIA. James S. McLester, Birmingham (*Journal A. M. A.*, Sept. 6, 1930), says that in the South is frequently seen a symptom complex that is exhibited with striking uniformity by an apparently heterogeneous group of diseases. This complex includes an anemia of variable degree, sore tongue, gastrointestinal disturbances, cord changes perhaps, and achlorhydria. Any one or any combination of these may dominate the whole and give color to the clinical picture, but achlorhydria is the one salient feature. It signalizes the group. The same case viewed by different men at different stages of its development or with different eyes is not infrequently placed by them in different categories; today the patient may appear to have sprue; seen at a later date he may be told that he has pernicious anemia or pellagra. The fact, then, that the diagnosis is so often determined by the momentary aspect of the disease or the bias of the physician would emphasize a possible intimacy of relationship between the several members of this group. Since the cause of the achlorhydria in each of these diseases is unknown, is it proper to assume that the gastric deficiency is of identical nature in all? And can this lack of acid be regarded therefore as the connecting link between several members of this group? Such an assumption is probably unwarranted. Yet, without predicating a single unvarying cause, it may still be possible to regard achlorhydria as the connecting link by assuming that it is the chance accompaniment of some more ultimate underlying gastric defect which, in combination with other factors of varying nature, expresses itself in symptom complaxes of such striking similarity as to bring all of these diseases within a single clinical group.

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# MANIPULATIVE OBSTETRICS*

JOSEPH H. SAYER, M.D.
SEATTLE, WASH.

Nine years ago I read a paper before this society, in which I described the methods employed by Drs. Irving Potter of Buffalo and Joseph DeLee of Chicago to shorten and render painless the second stage of labor. These were elective podalic version and prophylactic forceps. The reception given these methods was far from cordial, but in the years that have passed nearly all leading obstetricians have gradually adopted some procedure to lessen the suffering of labor.

Twilight sleep, rectal, spinal, paravertebral, sacral and intravenous anesthetics or analgesics have been used more and more generally, but while this has been a great step forward, the dangers to the child have not been lessened by these aids to the mother. The next step, therefore, is the adoption of some form of manipulative delivery that will shorten the second stage with benefit to both mother and child.

In presenting prophylactic forceps as the method of choice, DeLee gave as his reasons the increasing tocophobia (fear of childbirth) among women, and the large number of birth injuries due to prolonged autoexpulsive deliveries. The objects of his procedure are (1) to reduce the muscular and nervous strain of the second stage of labor, (2) to save the pelvic floor and adjacent fascia from overstretching, (3) to save the mother's blood, (4) to save the baby's brain from the evil results of prolonged compression and congestion. He asks, "If compression produces the caput succedaneum outside the skull, what does it produce inside?"

He states that prolonged normal deliveries have been responsible for skull fracture, rupture of the tentorium, intracranial hemorrhages, retinal hemorrhages, abruptio retinae, dislocated lens, facial paralysis, Erb's paralysis, rupture of the sternocleidomastoid muscle, rupture of the cord, and separation of the cord from the umbilicus, the most common dangers being asphyxia from abruptio placentae and compression of the brain. Statistics show that over four per cent of children die during birth.

This authority further declares that elimination of the second stage saves blood, promotes quicker recovery and deprives childbirth of its terror. The manipulative delivery preserves the pelvic floor and introitus, and forestalls uterine prolapse and rupture of the vesicovaginal septum. There are less puerperal sequelae, less retroversion, and involution is quicker. Potter makes the same claims and my own experience certainly confirms their views. DeLee cautions strongly, however, against the use of manipulative measures by the unskilled, but we should go farther than that and deny the right to practice obstetrics to every incompetent person, and I mean this in a very strict sense.

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* Read before a Meeting of King County Medical Society, Seattle, Wash., Oct. 28, 1929.

Too long, obstetrics has been a sideline in our profession, to be practiced by the trained and untrained alike, so that our mortality and morbidity rates place us at least fifteenth in the list of civilized nations. Even the cultists are attending deliveries. With our present conveniences of transportation, almost every woman is within reasonable distance of a competent accoucheur and hospital.

Until obstetrics is recognized as a major branch of surgery, and the same competence and skill demanded of the obstetrician that is required of the surgeon, the tremendous toll of maternal and fetal mortality and morbidity will continue. Furthermore, that satanically pernicious phrase of Frances Henry Ramsbottom, "meddlesome midwifery," must no longer be allowed to shackle progress in this field of surgery, and modern manipulations must become the practice of every obstetrician. For the last nine years I have consistently practiced manipulative obstetrics under anesthesia, and I would not think of returning to the practice of "watchful waiting" nor would the mothers who have been delivered by both methods consent to be delivered in the old way. During this time I have not heard one of my mothers cry out in pain nor have I delivered a baby with a caput succedaneum. The most frequent greeting on the following morning is, "Doctor, I can hardly believe I have had my baby."

In this paper, I wish to present to you the results of my personal experience with four manipulative procedures, viz: podalic version, elective forceps, intrauterine rotation and breech delivery.

## VERSION

I have consistently but not exclusively practiced elective podalic version since 1920, but have been unable in any detail to improve on the technic of Potter which I will briefly describe. First, I must state that in some hospitals in this city the practice of elective version is forbidden by decree of the respective staffs. Further, it is impossible to carry out the procedure comfortably without more nurse assistance than is usually assigned to the delivery room, so that the use of version must be limited to those hospitals that will cooperate with the accoucheur.

Following is a brief summary of the technic:

1. The first stage is made comfortable by the use of morphine gr. 1/6 and scopolamine gr. 1/200 in magnesium sulphate solution and, if necessary, analgesia by rectal injection of ether and quinine in oil.

2. When the cervix is effaced and the os dilated or dilatable, surgical anesthesia is induced by inhalation and the patient placed in the semi-Walcher position, either leg being held by a nurse.

3. The bladder is completely emptied and the vagina dilated by an ironing process, using first one finger, then two and three, and finally the whole hand and closed fist. Plenty of green soap is used as a lubricant.

4. The cervix, which must be soft and easily dilatable, is gently stretched with the fingers of the left hand. The outstretched hand and the arm is pushed high up between the uterine wall and the amniotic sac, which latter is gently separated by sweeping the fingers of the hand up and around, being careful not to work too near the placenta. The membranes are now ruptured high up, the position of the child and the location of the cord ascertained.

5. Both feet are then unfolded and grasped between the first and middle finger of the left hand, the left hand always being used, and gradually drawn down until the knees appear at the vulva, at which time the version is complete.

6. After a few moments rest in this position, gentle taxis is made upon the anterior foot and lower leg until the pelvis comes into view. This rotates the child until its back is transverse to the pelvic outlet.

7. The scapulae are now delivered by gentle traction and the torso gently rotated to the oblique diameter indicated by the position of the head. The index finger is inserted into the anterior axilla and the scapula rotated under the pubic arch, this action allowing the shoulder and arm to deliver themselves. The posterior shoulder is rotated under the pubic arch and likewise delivered.

8. The neck is now examined for the cord and, if found there, it must be loosened or cut and tied.

9. Following this, the fingers of the left hand are inserted into the baby's mouth and with the right hand gentle presssure is made upon the occiput over the pubes. This is the first time that any

pressure has been made from the outside. The right hand grasps the feet of the child and lifts it to a perpendicular position. The mouth is now exposed, and the mucus milked out of the throat; no haste is necessary. A slow delivery of the head is less liable to injure the perineal floor.

10. A milliliter of pituitrin immediately following delivery of the child usually causes prompt expulsion of the placenta. If this is delayed, crede expression is employed and, if necessary, intrauterine separation.

### ELECTIVE FORCEPS

Forceps properly applied should not make undue compression on the baby's head, but should act as a protecting cage to dilate the parturient canal and guide the head therethrough. In skillful hands forceps are very effectual and harmless, but should never be used by those who are not thoroughly trained to their use. The common prejudice against forceps is due to the fact that they have been reserved for cases of dystocia and often in unskilled hands. Therefore, mortality with instrumental delivery has been high. In a recent survey of Seattle hospitals by the Central Standardization Committee, using a temperature of 100.5° for a period of twenty-four hours or more as the test of morbidity, it was found that the obstetricians having the greatest number of maniplative deliveries had the lowest rate of morbidity. There has not been a single case of puerperal temperature extending over a period of twenty-four hours in my work during the past seven years.

In my technic of instrumental delivery I have departed far from that of DeLee as described in his writing on "prophylactic forceps," and I prefer to speak of the procedure as elective forceps. First, we must have the prescribed condition, that the child can safely be delivered vaginally. The first stage is then made comfortable, as previously described, by the use of morphine and scopolamine in magnesium sulphate solution and rectal analgesia if necessary. When the cervix is effaced and the os completely dilated or dilatable, the patient is taken to the delivery room. If dilatation does not take place in normal time, bags are inserted and dilatation thus completed.

When the cervix is ready, the patient is anesthetized and put up in low stirrups in a half lithotomy position. No matter who has previously prepared the patient, the accoucheur again prepares the field and vagina, following the same technic as would be used in an operating room for a perineorrhaphy or an episioplasty. The left hand holds a large lysol sponge over the vulva, while the right hand scrubs the surrounding region thoroughly with green soap which is rinsed off with bichloride solution. The left hand then changes sponges and continues the scrubbing into the vagina, cleansing thoroughly with green soap. The patient is draped while the operator changes gloves and gown.

Again the fingers are introduced through the vulva and the vagina stretched as before described. When this is completed, the hand is passed into the uterus and the position of the head determined by palpating one or both ears. If the occiput is anterior, forceps are applied in the usual way. If the occiput is posterior, intrauterine rotation is done and the forceps then applied. After the forceps are properly placed, the handles are locked at the proper distance. Slight traction is now used with one hand and the lower portion of the uterus gently pushed back over the largest transverse diameter of the forceps blades. This is important.

Grasping the forceps with both hands, the head is then brought down, carefully following the curve of the canal, until the perineum is reached and far enough through the vulva that the occiput can be held against the pubic arch by pressure on the forehead through the perineum. A half folded towel is now placed over the right hand and by slight pressure on the perineum, the head is held in place while the left hand unlocks the forceps and removes the blades, inclining each handle slightly inward to keep the tip of the blade from injuring the head. When the forceps are removed, the head is then delivered manually, an assistant making firm pressure on the uterine fundus through the abdominal wall. If the perineum delays the descent of the head and forceps, an episiotomy or perineotomy is done at an early stage instead of waiting until the soft tissues are in danger of laceration.

The shoulders and body are then delivered as usual and one milliliter of pituitrin given intramuscularly. The child is held up by the feet and the mucus milked from the throat. If it does not breathe promptly, five minims of coramine are injected deep into the thigh and almost invariably respiration begins at once.

By the time the cord is cared for, the placenta is ready to deliver and can easily be expressed by pressure over the fundus of the uterus. Any laceration of the cervix is then promptly and thoroughly repaired and those tissues separated by episiotomy are approximated, a subcuticular suture completing the operation. The index finger is now passed into the rectum to determine that none of the repair sutures has passed through the intestinal lining.

### INTRAUTERINE ROTATION IN OCCIPITOPOSTERIOR POSITIONS

Obstetric literature for many years past has contained articles dealing with the treatment of posterior positions of the occiput, but most of them are based on antiquated tocology and have not taken into consideration the more modern methods of accouchement. Textbooks were satisfied to explain how the occiput should by natural forces rotate to an anterior position, and how, if it did not do so, it must be delivered as an occipitosacral position. Scanzoni used forceps to rotate the head but waited until it was low, and the procedure never received a very cordial reception from obstetricians generally, and is denounced in a number of books. The Kjelland forceps have renewed the discussion.

At the time of complete dilatation of the cervix, more than half of the presentations are found to be occipitoposterior. One author gives the percentage as 61 per cent. If autoexpulsion is the chosen method of delivery, over sixty per cent of these will rotate to an anterior position. The others will remain posterior and most of these will demand assistance, which will be rendered in one of four ways, viz: forceps and traction, version, cesarean section or rotation.

If forceps rotation and delivery is to be the procedure, Kjelland forceps should be used. These have a slight curve, a sliding lock and may be applied as are other forceps, or by the Kjelland technic. The blades must be skillfully applied to the sides of the head and then gradually rotated until the occiput is anterior; gentle traction is applied and the head brought down through the vagina to the outlet, when the blades should be removed and the head delivered manually. The matter of traction is in great dispute, authors of equal standing declaring emphatically that rotation should always be accomplished before traction and, conversely, that the head should always be brought into the pelvis before rotation.

The policy to be followed in occipitoposterior position must be determined as soon as the cervix is fully dilated or dilatable. The accoucheur who waits until the head has begun to descend adds to his own difficulties and increases the danger both to mother and child. If disproportion exists and conditions do not forbid, cesarean section must be done, but if measurements are compatible, some manipulative procedure should be selected. To the disciples of Potter podalic version is the first choice. When this method is not adopted, the procedure I shall now describe is undoubtedly the operation of choice.

In 1921 I presented to this society a manipulative treatment of occipitoposterior positions that I had worked out and designated as "intrauterine rotation." This is carried out as follows:

The cervix being fully dilated or dilatable, the patient is anesthetized and prepared as described for elective version or elective forceps. After the vagina has been made roomy, the left hand is introduced and two fingers pass under the head through the dilated cervix, the position of the head being determined by the palpation of an ear. This may be deceiving until one is adept at interpretation. If the bag of waters interferes with this examination, it must be ruptured and the fluid allowed to drain off as slowly as possible. The whole hand then passes into the uterus, determines if the cord is around the neck, ascertains the position of the shoulders and sweeps the wall of the uterus to locate the placenta. At this point the patient must be well under the anesthetic and all uterine contractions inhibited.

The position having been found to be right occipitoposterior, the usual procedure is as follows: sweep the left hand over the back of the child, passing the thumb over the left shoulder to the left clavicle, and pass the tips of the fingers to the lower angle of the left scapula. Rotate the whole fetus through the right occipitoanterior position to a complete anterior, slide the hand to the right side of the face, introduce the right blade of the forceps, and guide it into perfect position. Have the assisting nurse hold the handle in this position. Withdraw the left hand and introduce the fingers of the right hand, passing the left blade into position, and cross the handles so they will lock. Apply axis traction, with or without the handles (I seldom use the handles) as in high forceps for right occipitoanterior position. Bring the head to the vulva and low enough that the forehead can be palpated through a towel on the perineum and the head held against the pubes. The head is then delivered manually, episiotomy being done if necessary.

In case of left occipitoposterior, the left hand is withdrawn before rotation and the right hand inserted along the back, passing the thumb to the right clavicle and grasping the right scapula with the tips of the fingers, rotating the shoulders through the left occipitoanterior position to a complete anterior, and the forceps then applied, left blade first. Should the placenta have been found to be in such a position that rotation, as described, might cause a separation, or cause the cord to become tighter around the child, then rotation should be made in the opposite direction through the long arc and the anterior position on the other side.

I have done this maneuver repeatedly, and it is most successful. Dr. R. N. Hamblen of Spokane, in a recent article, describes "suprapelvic rotation" as practiced by the late Dr. Ralph H. Pomeroy of Brooklyn; and DeLee, in the latest edition of his textbook, claims that he has practiced manual rotation for several years. However, in these methods the rotation of the head is the point stressed, while it is the rotation of the shoulders that produces the desired results. DeLee rotates the head and holds it in position with a volsellum tenaculum, while Pomeroy attempted to assist rotation of the shoulders by external pressure which is usually futile. Furthermore, they depend on uterine contractions for delivery.

By the method I have described, the fetus is brought into normal position by intrauterine rotation under anesthesia, and then delivered by forceps. The success of delivery by elective forceps method would dictate that, while the mother is under anesthesia, delivery should be continued and completed, thus correcting the malposition and also eliminating the second stage of labor.

### BREECH DELIVERY

Breech presentations occur in about three per cent of deliveries and the mortality is now three times that of normal positions. It, therefore, behooves us to find a method of delivery that shall reduce this source of fetal losses.

After becoming familiar with the technic of the Potter version, it was easy to see that in cases where the fetal and maternal measurements were not disproportionate, breech cases could be delivered similarly. The secret of success, as with all manipulative obstetrics, is the early diagnosis. The breech presentation should have been determined before the breech has begun to descend. In case of disproportion, cesarean section must be performed if the baby is alive.

The preparation is the same as previously described. When the cervix is completely dilated or dilatable, surgical anesthesia is induced and the hand introduced into the uterus as for version. Both feet are brought down and, when the knees pass the vulva, the child is in the same position as at the completion of version in Potter's method, and the remainder of the technic is the same.

### CONCLUSIONS

The disgraceful rate of obstetric mortality and morbidity shown by statistics demands a radical change in the attitude of the profession. Obstetrics must be recognized as a major branch of surgery, and only competent surgeons should be allowed to conduct deliveries.

Hospitals must maintain modern obstetric departments with complete equipment and thoroughly trained nurses.

All the aids of modern methods of anesthesia and surgical manipulations must be brought to both mother and child, and although pregnancy is a natural condition, we should not be satisfied in conducting delivery to allow "nature to take its course." Surgical judgment demands active rather than passive methods.

Manipulative delivery under anesthesia has robbed childbirth of its terror and lessened greatly the dangers to both mother and child.

Mothers return to normal more quickly, and children are born in better condition, if the second stage is shortened and rendered painless.

Manipulative obstetrics is being practiced more and more by our leading obstetricians and the profession in general should perfect its technic and adopt their methods.

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## RELATION OF GALLSTONES TO PREGNANCY

### REPORT OF A CASE *

RAYMOND L. ZECH, M.D., F.A.C.S.
SEATTLE, WASH.

Mrs. A. E. J., age 27, was first seen January 27, 1929, at which time she was having severe pain in the right hypochondrium. She stated that she had been married six years and was now approximately four and one-half months pregnant, with her first pregnancy. She had had several lesser attacks of pain during the past month. One year ago she had a very bad spell of "indigestion," with much pain in the upper abdomen. Two years ago had a similar but less severe attack. On several occasions the pain was sufficiently severe to require hypodermic medication for relief. In spite of the fact that her appetite was good between attacks, she had lost 15 lbs. in weight during the past six months. Shortly after she became pregnant she began to have considerable nausea and vomiting, and the attacks of pain became more frequent. Except as

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* Read before a meeting of King County Medical Society, Seattle, Wash., Feb. 17, 1930.

stated her health had always been good. One brother had died at twenty-seven of intestinal tuberculosis, one at nine years of age with "bowel trouble." Three sisters had died in infancy.

On physical examination the pulse was 96, temperature 99.2°, B. P. 120/80. Pupils regular, equal and reacted to light and accommodation. Teeth in good condition. Tonsils out clean. Thyroid approximately normal in size. Heart sounds clear and of good quality. Lungs normal, respiratory ratio and murmur. Abdomen. Patient had severe abdominal pain at time of examination. Marked right rectus resistance in upper abdomen, with much tenderness in the righ hypochondrium, even with slight pressure. Tenderness increased on deep inspiration. Abdomen revealed no other area of tenderness. Bimanual examination showed the uterus to be enlarged to about four months pregnancy. Reflexes were present and of normal response, with the exception of the knee jerks which were slightly exaggerated.

A diagnosis of cholelithiasis complicating pregnancy was made and operation advised. Morphine gr. one-fourth was given hypodermically to relieve the severe pain.

Patient entered the hospital January 28, 1929. Blood examination showed a moderate secondary anemia, with hemoglobin 79 per cent, erythrocytes 3,850,000. Leukocytes 11,000, with polymorphonuclear cells 80 per cent, mononuclear cells 20 per cent. Urine essentially negative.

Operated on January 29 under ethylene-ether anesthesia. High right rectus incision. The gallbladder was definitely thickened and filled with multiple stones. Riedel's lobe was present, but in other respects the liver was normal. The cystic duct and artery were identified and ligated, and the gallbladder dissected upward. Because of the many small stones present, which were pea-shaped, the common duct was incised and explored. No stones were found in the common duct. A No. 12 catheter was fixed in the duct with the tip extending towards the liver. A Penrose drain was placed in the subhepatic fossa and brought out through a stab wound to the right of the incision. The abdomen was closed in three layers.

Pantopon gr. one-third hypodermically was given sufficiently frequently to prevent any tendency which the uterus might have to contract. The patient's general condition continued good, except that the pulse was accelerated. This soon improved under proper treatment.

The catheter was completely withdrawn on the fourteenth day, at which time there was practically no drainage of bile. The patient remained in the hospital six days following this and was discharged February 18 as well.

Pathologist's report. Gross examination. Gallbladder 7 cm. in length. It is of an opaque white color, with very rough and congested outer surface. On opening, the walls are found thickened to a diameter of 7 mm. The mucosa is apparently denuded and the lumen packed with numerous small stones (more than 80 in number).

Microscopic examination. The mucosa is largely denuded of epithelium, except for occasional flattened plaques. A well marked inflammatory infiltration extends throughout all coats. The muscularis is highly edematous, infiltrated by both leukocytes and lymphocytes and shows large area of hemorrhage.

Pathologist's diagnosis. Acute cholecystitis, grade 4, with cholelithiasis.

The patient was later delivered at term by Dr. Charles D. Shannon of a normal female child weighing eight pounds.

In this particular case the symptoms of cholelithiasis had occurred previous to pregnancy, but were evidently aggravated by it. The case is reported, therefore, rather to stress the importance of appropriate early treatment to prevent untoward complications which might endanger the life of the mother as well as that of the fetus.

*History*. The first intimation of a relationship between pregnancy and gallbladder disease was made by Huchard in 1882 and Cyr in 1883. Dieulafoy in 1898 laid great srtess on this relationship and his views were supported by information gathered from the large obstetric clinics of Farnier and Penard. Not only pregnancy but the entire sexual life of married women seems to be closely interrelated to the development of gallbladder disease. In spite of this apparent relationship, there is little notice taken of its existence by even the best known obstetricians. DeLee recognizes the association of pregnancy and gallstones and dismisses the subject with only a few words of admonition against abdominal manipulation in the region of the gallbladder, which might result in its rupture. Little mention is made in the literature about this interrelationship. Reuben Peterson in 1910 published probably the most comprehensive information on the subject at that time. He cites a number of cases, personal and collected, and is able to draw certain conclusions.

*Etiology*. All statements in the literature agree in the opinion that cholelithiasis is an affection chiefly of women who have been pregnant. Women who have given birth to children suffer from cholelithiasis with several times the frequency of nulliparae. Multiparae are more frequently victims than uniparae. According to the statistics of Grube and Graf, out of a series of 657 married patients with gallstones, 613 had given birth to one or more children. Of William Mayo's 3075 female patients, 90 per cent were mothers, and in all of these the symptoms made their appearance during pregnancy or immediately after. According to Rosvig's series of approximately 344, more than 80 per cent were mothers and other statistics generally collected bear out a similar relationship between pregnancy and gallbladder disease.

*Various factors* common to pregnancy and gallbladder disease have been advanced as the direct or contributing etiologic factors, such as (1) changes in the cholesterol and calcium content in the blood and bile, (2) stasis, (3) infection, (4) gallbladder activity.

The cholestrin content in the bile of pregnant women is greater than in the nonparous or in men, with a resulting hypercholesterinemia in the pregnant state. A high percentage of diseased gallbladders are associated with gallstones and, when cholecystitis occurs during pregnancy, calculi are usually present. Aschoff and Bacmeister, however, have shown that gallbladder disease in certain persons may occur without signs of inflammation and that infection undoubtedly played no part in these particular cases. In view of this fact, stones may consist of (1) pure cholesterol, the result of disturbed metabolism without infection as a factor, (2) the multiple facetted stones, consisting of pigment, calcium and cholesterol, the product of inflammation and the result of bile stasis and which generally have some foreign body embedded in them.

Normally the cholesterin composition of the blood is .14 to .16 per cent, whereas in the pregnant woman it varies from .18 to .20 per cent. It increases gradually with pregnancy and a hypercholesterinemia continues on into the puerperium, when it gradually again approaches normal, becoming so in about two months.

*Stasis of bile* through the precipitation of cholesterin leads to the formation of the cholesterin stone. Stasis is especially apt to occur in the latter months of pregnancy, when the muscles of the abdomen do not contract normally and the gallbladder is not completely emptied. Peterson attaches significance to the fact that most attacks of gallstone colic occur at approximately the fifth month of pregnancy, when the uterus is approaching the level of the umbilicus and pushing the intestines upward with resulting pressure on the bile ducts, thereby causing a stasis of bile.

There is considerable experimental evidence to show that a stasis of bile is a favorable factor for the occurrence of infection. Hypercholesterinemia during pregnancy, with the addition of infection, even though mild, favors the formation of gallstones. Kramer has been able to precipitate semisolid masses closely resembling gallstones by ligating the cystic duct in dogs. It is a well known fact that as pregnancy progresses the mother has the burden of eliminating fetal waste products. Her own elimination is already below normal in the last months of pregnancy. With the added waste products of the fetus, the liver is unable to take care of the bacterial waste products, and infection of the bile tract is more likely to occur. Constipation is frequent during pregnancy. When to this one adds venous stasis, it is readily seen how infection by way of the portal vein is likely to result. Certain organisms, according to Rosenow, show a selective affinity for certain tissues. These are disseminated from various foci, such as the teeth, tonsils and colon, by way of the blood stream. Streptococci and colon bacilli, isolated from acutely inflamed gallbladders and injected intravenously into laboratory animals, resulted in the gallbladders becoming diseased. Other organisms, such as the pneumococcus and typhoid bacillus, have also been recovered from the wall of the gallbladder when injected intravenously.

Westphal has done considerable experimental work which largely discredits the older theories of external pressures and their importance as the cause of gallbladder disease. After much animal experimental and clinical investigations, he attributes great importance to the function of the biliary passages. He believes their action to be chiefly dependent upon Oddi's sphincter which is innervated from the vagus nerve. He found that slight stimulation of the vagus nerve causes excessive peristalsis of the gallbladder and of the biliary passages, and thus induces drainage of the bile, while pronounced stimulation causes a spasm sufficiently marked to prevent it.

Intereference with the vagus by stimulation of the sympathetic decreases the tone of the biliary passages, rendering them flabby and causing the sphincter of Oddi to close. Westphal called the condition a motor neurosis of the biliary passages in pregnancy. He felt that the congestion was neither mechanical nor inflammatory but a motility neurosis of the biliary passages caused by the increased tone of the vagus. He found a pronounced degree of increased tone of the vagus in pregnant patients. Various other workers, such as Lutkens and Bergmann, also came to the conclusion that the congestion was due to extrahepatic dyskinesia as well as mechanical causes. Drainage of the gallbladder then occurs through the sphincter of Oddi, which acts much the same as the iris.

The exaggerated excitability of the vegetative nervous system is evidently also responsible for the cases of jaundice and attacks of gallstone colic which sometimes appear in connection with menstruation. Frigyesi reports the case of a nursing mother who had an attack simulating a gallstone attack each time the infant was allowed to nurse. He states that these attacks were so regular and so severe that nursing had to be discontinued. After this the patient was free from attacks for the next three years. The attacks were repeated during the next pregnancy and a cholecystectomy was performed. The gallbladder contained numerous stones. He reports this case as substantiating the work of Westphal in regard to vagus irritation as a cause of colic attacks. Westphal, moreover, feels that the hypercholesterinemia of pregnancy is responsible for the disturbances of the hormones of the vegetative nervous system. The sensitizing effect of cholesterin upon the vagus has been proved in experiments by Storm, Van Leeuven and Van de Broke.

Gallstones usually consist of cholesterin and bilirubin, together with small quantities of calcium carbonate, calcium sulphate and calcium phosphate and a small amount of albuminous substance. Pure cholesterin stones are precipitated, whose histologic and chemical composition correspond to normal nonifected bile. These stones usually cause no trouble unless inflammatory symptoms are superimposed.

Just why hypercholesterinemia should occur in pregnancy is not readily answered at the present time. Hofbauer connects the condition with insufficient action of the hepatic cells. The histologic picture he describes would lead one to conclude that the parenchyma of the liver is so altered during pregnancy as to amount to an insufficiency. Rohman and Kusomoto believe that excessive disintegration of red corpuscles also alters the amount of cholesterin in the blood. Aschoff and Bacmeister believe that decreased elimination is responsible to a large extent for its excess in the blood. Hermann and Neumann concur in this opinion.

To clear up the question Bacmeister and Harvers performed a series of experiments for the purpose of determining the connection between the increase of cholesterin in the blood and its increased excretion in the bile. They were convinced by these experiments, which were made on dogs and continued for a period of several months, that hypercholesterinemia in gravidae is primarily the result of retention of lipoids, and also of increased excretion, but not due to the endogenous formation of cholesterin in the organism. Pribram investigated the cholesterin content of the bile in the liver and gallbladder, also that of the blood during various stages of pregnancy. He found that during pregnancy the cholesterin content of the bile was reduced and that of the blood increased, while, on the other hand, during the puerperium the cholesterin content of the bile was increased and that of the blood decreased. Pribram, therefore, concluded that increased concentration of bile in the gallbladder and its excretion therefrom are responsible for the predisposition to forming cholesterin calculi in the pregnant woman.

### PATHOLOGY

Biliary calculi may occur as single stones or they may be multiple and almost too numerous to count. Their size varies from that of small seeds to the size of a small hen's egg. In shape they may be pea-shaped, facetted, oval or occur in numerous other shapes. Gallstones nearly always develop in the gallbladder. However, the formation of stones in the liver and bile ducts does occur. When the stones are once formed they very readily become located in the cystic duct, common duct, hepatic duct or at the ampulla of Vater. The site at which a stone lodges, together with its size, are determining factors in the pathologic changes which result, such as cholangitis, suppurative hepatitis and empyema of the gallbladder. The entire wall of the gallbladder may be diseased or any of its membranous layers may alone be involved. The process may be acute or chronic, and may vary from a mild inflammation to a gangrenous condition.

It is a fact that gallstones do occur without producing symptoms sufficiently severe to make one suspect their presence. Such a careful observer as William Mayo states that these quiescent stones often become active during pregnancy and that in a number of cases he has been obliged to operate for relief of rapidly recurring colics, for obstruction with infection, and for the removal of stones which have been forced down into the common duct during the pregnant state.

The symptoms which occur are due either to mere presence of the stones in the gallbladder, resulting in so-called indigestion, or they result in severe pains while the stone is moving, commonly called gallstone colic. Again, due to the fact that the stone lodges in some particular spot, obstruction results with its usual train of symptoms.

Pain in the upper right quadrant is the most common and constant symptom in cholelithiasis. As stated above, the pain may be the result of a stone moving along the bile tract, or be caused by inflammation of the gall tract itself, or be due to pericholecystic adhesions, which are capable of producing severe disturbances of stomach function.

The pain most frequently radiates to the shoulder and back, to the epigastrium or the umbilicus. The onset is sudden and it becomes very severe, but is usually relieved by morphine in sufficient amount. Vomiting becomes marked and is frequently bilious. Jaundice according to some observers occurs in about 60 per cent of the cases and is significant of common duct obstruction. When chills and fever occur, one should always suspect common duct obstruction. The stools become clay colored, bile is present in the urine, there is an intense itching of the skin, mental symptoms develop, and the coagulation time of the blood is reduced.

The most constant physical sign of gallbladder irritability is the marked tenderness in the upper right quadrant when pressure is made by the examiner as the patient takes a deep breath. Right rectus rigidity also is usually present.

### DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS

In the presence of characteristic symptoms and signs the diagnosis of gallbladder disease is relatively simple. With the aid of roentgen-ray pictures, well taken and well interpreted, one is likely to reach a correct diagnosis.

When gallstone colic occurs during pregnancy it is necessary to differentiate it from miscarriage, ectopic pregnancy and acute appendicitis, while in the puerperium it must be differentiated from renal colic, lead colic, pyelitis and puerperal sepsis.

### TREATMENT

When one sees a case of pregnancy which is complicated by cholelithiasis, he immediately becomes impressed with the gravity of the situation. Upon the treatment which he carries out depends the life of both mother and child.

The treatment of cholelithiasis seriously complicating pregnancy should be surgical. Patients do much better under this type of treatment than with expectant or medical treatment. Early operation is the best guarantee against more serious complications, such as increasing jaundice, empyema of gallbladder or rupture of that organ with resulting peritonitis. Jaundice, whether acute or chronic, is a menace to the fetus, and one should never wait for this symptom to appear before operating. At no time is gallstone disease in itself an indication to interrupt pregnancy. William Mayo states that he finds it necessary to operate for this condition during pregnancy, and that recovery is always speedy. In no case did the operation produce spontaneous termination of pregnancy. The experience of most writers on this subject is similar.

Peterson states that the type of operation to be performed must be determined by the condition of the patient. When possible, operation should be postponed until the child is viable. The operative procedure which can be performed in the shortest possible time consistent with existing conditions, should be the operation of choice.

Cholecystectomy, except when the condition of the patient is so bad that the difficulties attending this type of treatment render its performance dangerous, gives the best results. In some cases the gallbladder must be retained for the purpose of drainage, and in such cases cholecystostomy is the operation of choice.

The mortality of cholecystectomy in trained hands is about as low as that of cholecystostomy. When one considers the secondary operations often required following cholecystostomy because a diseased gallbladder has not been removed, and those operations made necessary because a stone in the ducts has escaped detection, the mortality of cholecystostomy becames equal to or greater than that of cholesystectomy. It is of great importance to see that the ducts are free from stones. Mere palpation as a rule is not sufficient, and especially when multiple stones are present. In the latter case it is necessary to incise the common duct and explore the radicals down to and including the ampulla of Vater.

In the event that bile sand is found in the duct, prolonged drainage is of great importance. At times, even after careful operation, stones may reform and occur in the gallbladder or in the ducts. This is especially true where cholecystostomy is done. It must be remembered, however, that occasional stones are formed in the liver itself, and these later move downward. When cholecystectomy is performed for cholelithiasis complicating pregnancy, it is advisable to use drainage to give added security, when any doubt at all exists regarding leakage or peritonitis. The Penrose drain, since its presence adds little or no discomfort to the patient, is most valuable when leakage or peritonitis is feared.

### CONCLUSIONS

1. Gallstones occur decidedly more frequently in the female sex.

2. A definite relationship exists between gallstones and pregnancy.

3. When pregnancy is seriously complicated by gallstones, early operation, consistent with the condition of the patient, is advisable.

4. Operation for gallstones can usually be done without danger any time during pregnancy.

5. Cholecystectomy is the operation of choice and gives most assurance against serious complications.

6. When to the mortality of cholecystostomy is added that due to secondary operations, it is as great or even greater than that of cholecystectomy.

629 Medical-Dental Bldg.

# RECENT ADVANCES IN INFANT FEEDING*

E. J. Barnett, M.D.
SPOKANE, WASH.

Infant feeding progresses scientifically and clinically. The problem of feeding infants artificially, although it has not and may never be solved, is constantly becoming easier, simpler, more economical and more practical. The purpose of this paper is to present three recent scientific or clinical advances that should be of interest and importance to all physicians engaged in the care of infants. These practical aids are unsweetened evaporated milk for a single formula food, phenobarbital for relief of colic and vomiting, and the proper dosage of vitamin D for prevention and cure of rickets.

Most pediatricians prescribe a formula of diluted sweetened boiled whole milk for the majority of the artificially fed infants under their care. This type of formula is most satisfactory, proper and economical. On the other hand, many physicians in general practice who have not learned to apply the few simple rules for this type of feeding and who are thoroughly dismayed by the wide variety of advertised baby milk foods, resort either to one acid whole milk formula or to one advertised baby food for every infant under their care. Invariably the advertised food is unnecessary, poorly balanced in proper food essentials or expensive.

It is important to call to your attention that all infant foods of all kinds, whether or not they are boiled, diluted with plain or cereal water, acidified or made alkaline, have in common the one ultimate aim of reducing the milk curd both in size and consistency. At the present prevailing cost of fresh cow's milk, a diluted sweetened boiled formula can be prepared in the home daily for a period from the infant's birth to nine months of age for a total minimum cost to the family of approximately thirty-five dollars. For comparison, one of the most widely advertised and used baby foods, if fed daily over the same period of time and in amounts according to the firm's own recommendations, would require a total of one hundred and fifty-one cans at a cost to the family of approximately one hundred dollars. In spite of the expenditure of this excessive amount of money, the infant fed on the advertised food is not better nourished or developed than the one fed on the simple whole milk dilution, and yet the parents have spent an unnecessary sum of money that might well be applied elsewhere. The diluted boiled whole milk formula reduces the milk curd in the infant's stomach both in size and consistency, and the expensive advertised baby foods may do the same but no more.

Parents are constantly consulting us for a change in formula for their infant fed on these expensive advertised foods. They do not necessarily complain that the infant is not doing well but they are desirous of an economical and yet proper formula that can be prepared in the home. Such a formula is found in whole milk dilution, if the physician applies the following simple rules.

1. An infant needs about two ounces of milk per pound of expected body weight per day.

2. One to two ounces of sugar should be added to the total day's formula.

3. An infant at each feeding may be given two to three ounces more of formula than his age in months. The difference between the total amount of formula and the cow's milk consists of plain water.

4. The formula should be actively boiled for about three minutes.

For the physician who will not prescribe whole milk dilutions, who will not individualize the babies under his care for the type of food best for them under different circumstances, but who will use only one formula for all babies of all ages at all times, unsweetened evaporated milk at least meets his needs and provides an excellent and economical food for the infant.

Unsweetened evaporated milk is a liquid concentrated milk. In its preparation fresh whole milk from healthy cows is reduced to about one-half its volume by evaporation by high degree of heat. After the evaporation the milk is forced through a small aperture by 2000 to 3000 pounds of pressure, this process rendering multiple subdivisions of the fat globules, and preventing the fat or cream from rising to the surface. The final product is sealed in cans and sterilized. Sugars or preservatives are not added. The milk remains sterile until the can is opened, when the same bacterial contamination from unhygienic measures, such as unboiled utensils and lack of refrigeration, may occur as with fresh milk. Unsweetened evaporated milk is a standardized product that is legally controlled and sold under Federal inspection and regulation It is most inexpensive.

The subdivision of the fat globules practically assures complete digestion and assimilation of this essential element. The protein curd, by reason of the high degree of heat to which the milk has been subjected in the evaporation, is coagulated in the infant's stomach in fine gelatinous easily digested curds.

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Consequently, with the use of this product, there is available for infant feeding an economical, sterile, concentrated and easily digestible canned milk of uniform composition. Daily refrigeration does not become necessary until a fresh can of milk is opened. Where refrigeration is often impossible, as in traveling, the smaller sized cans can be used for each individual feeding and the unused milk discarded.

Although unsweetened evaporated milk may be used in the preparation of an infant feeding formula under most circumstances, it is particularly valuable not only in traveling but also where families reside in the woods, in lumber camps, or at the lakes in summer where fresh milk cannot always be obtained. The simplicity of preparation of the formula with this milk makes its use indicated in that type of foreign mother who understands poorly and becomes easily confused. Since it is unnecessary to actively boil a formula of unsweetened evaporated milk, as we recommend in whole milk dilutions of fresh milk, this milk is of further value in the home where the only available heat for cooking is from the hot cook stove. In the weak, or premature, or anorexic infant who takes but little milk, a concentrated milk food of this type provides a high caloric intake.

Unsweetened evaporated milk may be fed undiluted, but since it is a doubly concentrated cow's milk, the usual and natural method is to dilute it with the same amount of water. A standard total day's formula for an infant consists of equal parts of unsweetened evaporated milk and water with an ounce of sugar added. If a half teaspoon or at the most a scant level teaspoon of lactic acid is added to the total day's mixture, the formula is taken more readily. An infant of any age may be given as much of this formula as he will take on a four hour schedule.

### THE USE OF PHENOBARBITAL

Vomiting in infants fed on unsweetened evaporated milk is less often observed than in infants fed on most other types of artificial liquid milk foods. The reason is that this concentrated milk has a thickening effect and the smaller protein curds leave the stomach more rapidly.

However, there are always infants who have persistent projectile vomiting and those who have colic. It is in these cases that we have found the use of phenobarbital is indicated. This drug apparently has not only a local antispasmodic action on the pylorus and small intestine but also a sedative effect on the "vomiting center" in the brain.

The clinical results, with the use of this remedy in the projectile vomiting of pylorospasm and pyloric stenosis and in the pain of colic, have been so striking that this remedy is now used routinely by us in these disturbances. The success of the thick cereal diet with added phenobarbital in infants with pyloric stenosis or marked pylorospasm is greater and obtained with less worry than when increasing doses of atropine are prescribed.

Phenobarbital may be given in ⅛ gr. amounts before or in each milk feeding. As the vomiting or colic improves, the phenobarbital may be administered with every other feeding, then twice a day and then stopped, resuming the original dosage if the trouble recurs.

### THE VITAMINES

Scurvy and rickets remain the deficiency diseases that concern us most in infant feeding. Scurvy, however, is now rare in infancy since the popular routine daily addition of orange juice or the less expensive tomato juice to the diet. The occasional development of scurvy is usually seen in that infant who refuses to take fruit juice when on a formula of evaporated or boiled milk. This refusal can be met by the addition of the fruit juice directly to the cooled milk formula. The mother can be advised that the addition of orange or tomato juice to the milk itself is of no harm to the food.

Rickets is still too common, even with the daily addition of raw egg yolk to the finished formula or the administration of cod liver oil or its present popular substitute of viosterol. We believe that the frequency of rickets in infants growing at a normal rate, receiving proper food, and living under satisfactory hygienic circumstances, usually results from the administration of a cod liver oil of inferior standard or of viosterol in insufficient amounts.

Cod liver oil should be added to the diet daily, beginning at about six weeks of age and continuing until the infant is about eighteen months old. An infant in this region of the country apparently needs from one to two teaspoonfuls daily. We are occasionally chagrined to find rickets in infants under our care, only to learn almost without exception that the mother has substituted for the cod liver oil originally prescribed a widely advertised, popular, and yet poorer brand of oil. With a return to the original cod liver oil clinical cure of the rickets results.

Since cod liver oil contains both vitamines A and D and viosterol is vitamin D alone, it seems indicated to prescribe viosterol only in those infants who cannot or will not take or retain sufficient cod liver oil even when it is given in fruit juice or in the formula, or for those mothers to whom cod liver oil is so distasteful that they fail to cooperate in giving it to their infants.

Viosterol has several advantages over cod liver oil. It is quite odorless and tasteless, and is given in smaller amounts. Furthermore, it is reliable and rapid in its action against rickets. Because it is not disagreeable it can be administered plain, in fruit juice water, or in the milk without the infant's knowledge. The disadvantages of viosterol are its expense, especially if it is prescribed in the necessary full dosage, and its failure to protect against respiratory infection, since it is devoid of vitamin A. Since its potency is such that one drop is equivalent to one hundred drops of a standard high grade cod liver oil, the tendency has been to prescribe it in two or three drop dosage. From previous observations on apparently normal infants under our care receiving viosterol we now find ourselves prescribing a minimum of twelve drops of viosterol daily to prevent rickets and we often find it necessary to prescribe eighteen or even twenty. Hess has recently stated that for absolute protection against rickets full doses of twenty to thirty drops daily of the present viosterol solution are necessary.

Rickets is a disease of only the first year or at the most the first year and a half of life. Viosterol is an agent that is specific for infantile rickets, for the extremely rare osteomalacia or adults rickets, and for tetany. We are constantly seeing children, past the age of rickets, for whom the expensive viosterol has been prescribed for relief of conditions for which it can be of no value. We are continually hearing of adults receiving large doses of viosterol for relief of abnormal conditions. It is well to repeat that viosterol is a preventive and cure of two conditions limited to infancy, rickets and tetany. It is not indicated and is probably of no value in the treatment of such conditions as dental caries, respiratory infections, anemia, healing of fractures and induction of growth.

With these practical and recent advances not only pediatricians but all physicians have available a proper and economical single formula food, a valuable remedy for relief of colic and vomiting, and a specific agent for prevention and cure of rickets.

# AN EXPERIENCE WITH EVAPORATED MILK IN INFANT FEEDING*

Harry C. Olmsted, M.D.
SEATTLE, WASH.

In recent years the use of unsweetened evaporated milk as an infant food has increased rapidly. Coincident with its clinical trial, laboratory investigations by biochemists and nutrition workers have focussed attention on this product. It can now be said that evaporated milk has some distinct advantages which have earned for it a prominent place in the realm of infant feeding.

Cow's milk is almost exclusively used in civilized countries for the artificial feeding of infants. However, raw cow's milk was designed primarily for calves, and when it is given in an unchanged state to young babies, the majority of them display digestive disturbances such as colicky distress and the vomiting or passage in the stools of undigested curds of milk. In addition, raw cow's milk may contain pathogenic bacteria.

It has been fairly well established that the carbohydrate and the fat play minor roles in the intolerance exhibited by infants toward cow's milk. Experiments and clinical experience have taught us that it is the protein which causes the chief difficulty. The principal protein of cow's milk is casein, while the larger part of human milk protein is lactalbumen. In the baby's stomach cow's milk casein tends to form large masses or curds of calcium caseinate which are mechanically difficult for the stomach to digest or propel through the pylorus. These large, hard masses are quite in contrast to the small flocculent curds formed in the stomachs of babies receiving breast milk. The curds of raw cow's milk are liable either to be vomited or to be passed in a partially digested state in the stools. They undoubtedly contribute considerably to colicky pain.

Nearly all of the methods which have been designed to make raw cow's milk adaptable to infants have on subsequent examination been found to have accomplished one thing: they have changed the hard casein curd to a smaller and softer form, in which it can be more easily digested. These methods have included boiling the milk, diluting it with water or cereal water, adding alkalis, such as sodium citrate or lime water, etc. By such standard modifications cow's milk is satisfactorily digested by the majority of healthy young infants.

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A certain percentage, however, still display digestive disturbances and in these it is assumed that the alteration of the curd has not been sufficiently complete. Also, the modified formulas may be too diluted to furnish the required number of calories per ounce.

Marriott[1] and others have in recent years popularized the feeding of whole or diluted cow's milk, previously acidified by bacterial souring or by the addition of lactic acid or acid fruit juices such as orange or lemon juice. Marriott had previously demonstrated that the buffer action, or capacity of cow's milk to neutralize the hydrochloric acid of the infant's stomach, lowered the hydrogen ion concentration below the point for optimum gastric digestion. The previous addition of acid, in his opinion, corrected the subnormal acidity and so favored proper digestion.

More recently Brennemann[2] has pointed out that adding acid to cow's milk produces another important change, favoring ease of digestion; it produces a very small, soft casein curd. Both Marriott and Brennemann have since become enthusiastic advocates of evaporated milk, one of the chief attributes of which is the production of the smallest, softest and most easily digested casein curd known in cow's milk feeding. Marriott still contends that acidification of evaporated milk further increases the digestibility of that product. On the other hand, Brennemann fed a group of acutely ill infants an evaporated milk formula, in which for alternate two week periods he added lactic acid or withheld it. As far as he could determine the infants digested the feedings equally well with or without acidification.

What is unsweetened evaporated milk? It is mixed herd milk concentrated by evaporation approximately to 40 per cent of its original volume. It is then homogenized, i.e., forced under enormous pressure through minute openings in a special valve or through a porous plate. This breaks up the original large golbules of fat into a finely emulsified state so that subsequently cream does not separate. Finally, the product is sealed in cans and sterilized at a temperature of 240° F. Its composition is controlled within narrow limits by federal food regulations.

The quantitative relationships which exist between whole cow's milk and unsweetened evaporated milk are shown in Table I.

TABLE I.

| | Fat | Carb. | Prot. | Min. Salts | Calories |
|---|---|---|---|---|---|
| Cow's milk .......................... | 3.75 | 4.5 | 3.5 | 0.75 | 20. |
| Evaporated milk ............... | 7.85 | 10.0 | 7.0 | 1.6 | 43. |
| Evaporated milk and water (equal parts) | 4.00 | 5.0 | 3.5 | 0.8 | 21.5 |

Simply stated, evaporated milk contains approximately twice as much of the individual food elements as does cow's milk. Adding to the former an equal amount of water practically restores it to its state before evaporation, as far as food values and percentages are concerned.

Evaporated milk differs from raw cow's milk in another important manner. The casein is so changed by the manufacturing process that it forms in the infant's stomach an extremely small and flocculent curd. This alone is probably the chief factor in its high digestibility. The emulsification of the fat undoubtedly results in easier digestion of that element. The absolute sterility of evaporated milk has never been questioned. This is an important consideration in communities where the fresh milk supply is unsafe. The only vitamin destroyed by evaporation is the antiscorbutic vitamin C. Pediatricians no longer depend on either breast or cow's milk to supply this vitamin but add it to the infant's diet in the form of orange juice. Evaporated milk is as cheap or cheaper than fresh cow's milk and is easily procurable.

One wonders why unsweetened evaporated milk was not used earlier for infant feeding. Marriott believes that an "uncritical prejudice" against canned products in general has been the chief factor delaying its widespread adoption. Another factor I believe to be the prejudice held by physicians against sweetened condensed milk. Like evaporated milk this product is concentrated milk, but it differs from the former by the addition of 40 per cent cane sugar. Sweetened condensed milk, best known in trade as "Eagle Brand," has long enjoyed a well earned reputation as an easily digested infant food. The chief objection to it has always been that, in order properly to dilute it for infant feeding, the protein, fat, mineral salts, and vitamins have been too greatly diminished. When fed for long periods, without the addition of other foods and vitamins, such serious nutritional disturbances as rickets, scurvy and anemia frequently have developed. Unsweetened evaporated milk, when properly modified and fortified by the addition of the above mentioned food factors to the infants' diet, does not lead to the development of deficiency diseases.

I began to use unsweetened evaporated milk in infant feeding over a year ago. Since then I have used it increasingly, not only in private practice but also in hospital wards for infants and in infant welfare clinics. No attempt has been made to use it exclusively. During this period more babies have been raised on the customary milk-water-sugar mixtures than on evaporated milk. The latter has been used principally where infants have shown an intolerance to fresh milk formulas, or have been in need of concentrated feedings. It has also been employed for infants residing where fresh milk was not obtainable.

When babies receiving fresh cow's milk have exhibited colicky distress and vomiting of large curds or passage of curds in the stools, marked improvement has often followed the simple procedure of substituting an evaporated milk formula. In many instances the administration of antispasmodic drugs has not been found necessary. Severe cases of colic have responded well to a combination of evaporated milk feedings and proper doses of atropine or phenobarbital. In infants receiving inadequate quantities of breast milk, evaporated milk has proved a very satisfactory complemental feeding.

The calculation of an evaporated milk formula is a simple problem for any physician accustomed to computing fresh milk dilutions. Suppose that an infant of six to eight weeks of age and weighing eight pounds requires this formula:

| | |
|---|---|
| Fresh cow's milk | 16 oz. |
| Carbohydrate | 1 oz. |
| Water to make total | 30 oz. |

The practical equivalent of the above formula when evaporated milk is substituted is:

| | |
|---|---|
| Evaporated milk | 8 oz. |
| Carbohydrate | 1 oz. |
| Water to make total | 30 oz. |

If the infant's digestive capacity is small, less water is added, so that the individual bottle feedings are correspondingly smaller.

Where vomiting is due to pylorospasm or to true pyloric stenosis, a formula unaided could scarcely be expected to alleviate the condition. In conjunction with appropriate medical or surgical treatment evaporated milk formulas have proved very helpful on account of the high digestibility and freedom from large curd formation.

For premature babies deprived of mother's milk evaporated milk is often a life saving measure, especially now that the professional wet nurse has practically passed out of existence. These small infants have a very limited stomach capacity and low digestive powers, yet they are above all in urgent need of a food of high caloric content. This can be furnished by evaporated milk and water in equal parts, i.e., reconstructed whole milk. This mixture may further be enriched by adding carbohydrate (corn syrup, dextrin-maltose, or cane sugar) in amounts equal to 3 to 10 per cent or more.

During January and February, 1930, a group of sick infants in the wards of the Children's Orthopedic Hospital, suffering from such acute infections as otitis, pyelitis and pneumonia, were fed evaporated milk formulas. These were at least as well if not better taken than any previous milk mixtures which I have employed in such cases.

In the several conditions which I have just enumerated, I have found evaporated milk to possess all of the advantages which I had formerly seen while using lactic acid milk for infant feeding. Like the latter it can be fed as the full equivalent of whole cow's milk, an important consideration in planning high caloric feedings. In addition, evaporated milk has the advantage of being cheaper than lactic acid milk, more easily available and more palatable for some infants, especially older ones. It is easier to prepare in the home than any form of sour milk.

I wish it distinctly understood that evaporated milk is not indicated in those cases where severe malnutrition and severe diarrhea go hand in hand. In such babies suffering from athrepsia a sour milk in the form of skimmed lactic acid milk or protein milk is indicated.

Infantile eczema offers another field for the trial of evaporated milk. The majority of these infants are sensitive to one or the other of the milk proteins of cow's milk and marked improvement in the cutaneous lesions is often shown when an evaporated milk is substituted for fresh milk in the formula. The theory which has been advanced to explain this is that the process of evaporation denaturizes the milk proteins in such a manner as to render them less capable of exciting an allergic response in the infant's skin. Of the last seven bottle fed babies with eczema whom I have treated, six showed showed satisfactory improvement when evaporated milk was used in conjunction with local measures. In the remaining infant it became necessary temporarily to withhold milk from the diet and to substitute a soy bean flour formula ("Sobee").

For infants while traveling, or living in regions such as Alaska where fresh cow's milk is not available, evaporated milk is a wholly adequate substitute. Here I believe it to be superior to dried milk, as the latter is not always sterile and is somewhat more difficult to restore to liquid form.

In conclusion I desire again to emphasize the principal advantages of unsweetened evaporated milk in infant feeding.

1. It is entirely adequate from a nutritional standpoint when fed in conjunction with other foods and vitamins.
2. It can be given in a concentrated state equivalent to whole cow's milk.
3. It is easily digested.
4. It is palatable, from the infant's standpoint.
5. It is cheap and easily procurable.

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## TRAINING THE CHILD TO EAT*

Charles E. Hunt, A.B., M.D.
EUGENE, ORE.

Volumes have been written on the subject of infant feeding during the last decade, and there is no field in which there has been more rapid progress. Mortality and morbidity rates among children have been wonderfully improved. One-third as many children die of gastrointestinal diseases today as did twenty-five years ago.

With all this remarkable progress in welfare work and teaching of infant feeding, very little has been written on the technic of feeding. We are told what the child should eat and how much and just what the gain should be, but as to a rational technic of accomplishing this we are left very much in the dark. In fact, the standards we have set up have caused parents and workers to become overdiligent in their attempts to have the child measure up to these standards, and there has arisen a loss of judgment, an overanxiety and an exaggeration of the importance of weight gain and growth. As a result of this the child has been urged, forced and cajoled into eating until more and more, even to an appalling degree, he is being presented with the symptoms of loss of appetite and we are asked by worried parents what is to be done about it. It is strange, indeed, that so primitive and basic a function as eating should have gone wrong in this age of scientific knowledge.

Very little has been written on the subject of hunger and appetite, and that only very recently. With all that has been said, very little real scientific research has been done along this line and only a few real facts are known. The leading pediatrists today are telling us that from 25 to 50 per cent of the children brought to them or seen in the clinics and dispensaries come for loss of appetite, and that in a large proportion of them no organic disease to account for the condition is found. One out of three or four children is found to be underweight according to present standards, and this in an age and in a country where we have an excess of food. Strange to say, the greatest complaint of anorexia comes from the children of the rich and not from the poor, from the children who have the best of care and medical attention, and from those who have the least number of physical defects.

It should not be necessary to train a child to eat. Animals do not have to be thus trained, the young of all animals eating naturally with good appetite. Children in orphan homes are not trained to eat, nor do they suffer from loss of appetite. Watch them and see how eagerly they consume all they can get.

Have we too much food, are we too anxious to feed, are we interfering with nature's mechanism in our overenthusiasm? Before our present standards were set up, and so much was said relative to gain in weight, we did not have this enormous problem of loss of appetite. The children of yesterday ate much better and with better appetite than today. Before the war in Europe and America the symptom of loss of appetite was becoming prominent. Ochsenius says that during the course of five years in war time not one child was brought to him for loss of appetite.

The desire to feed her child is a deep maternal instinct and every mother wants him to become large and strong and thinks of her offspring in these terms. This causes her to become overzealous, and especially so when she is constantly told that her child must come up to a certain standard. Children differ in their caloric needs as much as 30 to 40 per cent according to competent authorities. Heredity has a great deal to do with the size and growth of the individual child and can not be materially changed. The slender child, if organically well and coming from slender parentage, will be slender, and no amount of overfeeding with consequent loss of appetite will alter the situation. A child may be overfat and have rickets and other serious nutritional diseases. There are children who are heavy and others who are light eaters. Children at times are good, and at other times under certain conditions are poor eaters. There are other standards besides gain in weight, namely, absence or presence of rickets, posture, anemia, firmness of muscles, energy, brightness, happiness, etc.

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This problem of getting the child to eat does not so much concern him as it does the parent and attendant. It is not alone a problem of physiology but a consideration of the psychology of the situation. It seems to me that the mother's attitude towards feeding has made this problem possible and brought about the situation of difficult feeding and loss of appetite. The parent must be properly educated and trained, and in many cases the physician as well.

There is no gainsaying the fact that disease conditions are the underlying cause of some difficult feeding cases and these must always be ruled out. However, when this is said and done, the great majority of cases will show, upon taking a proper history, many errors in technic, handling, environment, etc. It is with the scientific facts of hunger and appetite and with the technic of accomplishing feeding of children that I wish to deal, also the causes of loss of appetite and the treatment of this condition.

Hunger, according to Webster, is a sensation due to want of food. Appetite is an inherent or habitual desire for gratification. In other words, hunger is sensation, appetite a desire. Carlson has shown that "hunger appears synchronously with vigorous contractions of the empty or nearly empty stomach. The pangs of hunger vary in intensity with the amplitude of these contractions. These hunger contractions are inhibited by putting almost anything into the stomach, by the sight of food, various emotions, fever, etc. They are placed in the category of an internal self-regulating mechanism, the same as contractions of the heart muscle."

Apppetite, being a pleasant desire for food, has to do with memory, habit, enjoyment, pleasant emotions, sight, taste, smell, eating, etc. Hunger contractions are present in the baby soon after birth. Appetite probably enters the scene very soon afterwards, being composed of an infinite number of pleasant memories. According to Aldrich, "hunger sets the ball rolling, and then appetite plays its part." Thus we see that a well organized mechanism has been provided to assure that the child shall eat. This mechanism is as definite and well organized as that of breathing, the beat of the heart, etc. Nature would not leave us without a proper mechanism when it comes to so important a function. Until recently very little was understood regarding this mechanism and it is to Carlson that we owe most of our knowledge.

There are still many unknown factors. Does a condition of the blood bring on the phenomenon of hunger; are there hormones which affect it? What about the concentration of blood sugar and other elements in the blood? The future will solve many of these questions which are of vital importance. We have enough knowledge at present, however, to furnish a working basis for consideration of the subject of appetite and feeding.

Anything which tends to retard the emptying of the stomach delays the sensation of hunger. Poor mastication, eating between meals and eating of foods which remain too long in the stomach are important factors. High fever, as shown by Carlson, inhibits hunger contractions. Perhaps interference with the nerves connecting the stomach with the brain during certain diseases might alter this hunger mechanism. Unknown chemical factors may play some part. Mental factors may obstruct the functioning of this hunger-appetite reflex.

The more we study this delicately ordered mechanism of hunger, appetite and good digestion, the more we marvel at its wonderful make-up, and the more we respect it. The more we know about it, the more we respect its workings and the less we tamper with it, the better results we shall obtain. Just as we would be foolish to try to regulate the breathing reflex, and say just how much oxygen the body should have at a certain time, so it is foolish to prescribe calories in definite amount and insist that just so much food should be put down the throats of children at just such a time and in a certain manner. Today this mechanism of hunger-appetite is not working successfully because we have been tampering with it in a way that shows we have not understood it.

In addition to physiologic, chemical and other factors mentioned above, there are very definite psychologic factors which influence appetite. Everything which disturbs equanimity of mind influences the keeness of the child's appetite. Nervous anorexia may become a vicious circle. Poor appetite leads to irritations at table, forcing, nagging, family scenes, unpleasant memories and rebellion. What otherwise could have been corrected by proper means becomes a fixed psychologic state and the normal hunger-appetite reflex is inhibited.

Even negativism may develop. If the child is told he must eat, he naturally displays an independence and loses his natural desire for food. He begins to revolt. If this goes far enough, he may revolt at the sight of food and even vomit. A child may use eating as a big stick to obtain his desires with his parents. He may refuse to eat unless he gets his way. He may refuse to eat to obtain attention, as most children are human and like to be in the limelight. He enjoys being talked about and revels in the fact that he is the center of the stage.

It is extremely important that the parent know considerable about child psychology, for otherwise many serious errors creep in and a simple problem may become very complex and sometimes unsolvable. It must be realized, however, that proper early training in eating must be carried on with firmness, while the child is going through an educational period from infancy to young childhood. This technic will now be discussed briefly.

Prevention of any disease is more important than treatment of the established condition. This is particularly true of the appetite problem. The most important means of preventing poor appetite is education of parents and others as to the true nature of anorexia and its causes. The physician should take this matter up with the parents upon the first visit to the baby and should thoroughly instruct them on this subject. Loss of appetite should be reported as quickly as vomiting, diarrhea or any other important symptom.

No child should be forced to eat except under the rarest of circumstances. Forcing food has never accomplished anything but disaster to the child and is harmful to the peace of mind of the household. Great psychic harm results from conflicts over meals and far offsets any possible physical gain which might be made. The fact is, that force does not increase food intake or gain in weight, but does the opposite.

It is a question whether supplemental food given the first few days of life before lactation is established is of real value. This practice by keeping the stomach full interferes with hunger, and makes the baby less eager for the breast. It is often a cause of failure to learn to nurse, as the baby readily learns to prefer the bottle. Thus an appetite problem is presented at birth. As a routine it is better to offer nothing but water until after secretion of the mother's milk has begun.

The presentation of the bottle, however, during the first month of life, after the breasts are filled, is important. The baby should accustom himself to the artificial nipple and taste of artificial food, along with an appetite for the breast, or later on this will be very difficult. We have all seen babies who utterly refused a bottle in later months because they had not been accustomed to it in early infancy. A bottle of artificial food should, therefore, be given often enough to build up a memory complex and is a procedure aimed at development of good appetite later on. Water by bottle should be given daily. Orange juice and cod liver oil should be given by spoon in the early weeks in order to educate the baby's taste for these and educate to the use of a spoon.

The weaning time is another period fraught with many dangers from the standpoint of appetite development. It should be gradual. If the above previous education has been carried on, there should be no great difficulty. Otherwise there may arise a very serious situation and the baby may emerge with an unpleasant attitude towards food. Many children date their loss of appetite from the weaning period. Early education with the bottle will obviate this. If there is refusal to take the bottle at the weaning time, there should be a short starvation period of eight to twelve hours, followed by a very weak food mixture in small amount, and when appetite asserts itself the strength and amount of food should gradually be increased. There should be no forcing at this time, and the food offered should lag behind the desire for it.

Likewise, the baby should be accustomed to solid foods gradually, seeing that no unpleasant situations arise. When the first solid food is offered, see that this is done when the baby is hungry. Offer a small amount, and instruct the mother that if it is spit out or regurgitated, this is no sign that it is disliked or that it disagrees, but merely that the child has not yet learned to swallow solids or become accustomed to a new taste. Use patience, offering only a small amount and give time for one food to be learned before another is offered. By using the proper technic at this time, success will be had, providing one starts early, uses firmness and perseveres. By the gradual addition of new foods from month to month an infant a year old should be well educated in eating many foods and have developed a good appetite for them.

If we are to develop good appetite in the nursling, we must be careful and avoid overfeeding and feeding at too short intervals. It is better to have the baby take his food eagerly and want more than to be offered too much. Unless he completely drains the bottle, no additional amount is offered. With the first loss of appetite there should be a reduction in the amount of food offered. By no means should force be used. This may be the starting point of a serious anorexia and difficult feeding history. This temporary loss of appetite may be due to an oncoming cold or infection and is nature's method of handling the situation.

Psychologic factors increase with the age of the child, and appetite becomes the controlling factor. Most of the problems encountered in the older children are psychologic and only a few physiologic. In the child over a year of age we must be careful not to insist upon definite amounts of food. If the child has been properly trained up to this time, appetite will be a reliable guide. If he is healthy and has been properly trained, he will eat the right amount of food if properly selected and put before him, providing he is let alone and no psychologic errors committed.

The surroundings should be pleasant, the mealtime happy and natural. Eating should be considered a natural thing and a pleasure and a privilege. All attendants should have a detached attitude and by no means be solicitous. Story telling, rewards, punishments, etc. have no part in this picture. No undue criticism or strong emotions should be allowed. As an important factor, a good example should be set by parents and others. Everybody connected with the child should temporarily forget the subject of food intake and gain in weight.

The first and most important duty is to develop a normal, healthy appetite, upon which everything else depends. In a word, the formula is to provide regular meals of good quality, properly and attractively served, pay no great attention to table manners, give a definite time in which to eat, and food served without a word being said about it. The general attitude should be that we do not care if he eats it or not.

In the older children there are certain physiologic factors which do affect appetite. A diet rich in fat by remaining too long in the stomach tends to inhibit hunger contractions. All foods rich in fats pass out of the stomach slowly. Therefore, eliminate all fried foods, nuts, greasy foods, etc. Milk is slowly passed out of the stomach because of its fat content and its tough curds, especially unboiled milk. It is not the most important food for older children, and in some cases is the major cause of loss of appetite for other food. Many times it must be reduced in amount and occasionally eliminated.

Long intervals should be had between meals. In this way hunger contractions have time to appear. By one year of age three meals a day are best, with no lunching between. The habit of taking bits of food between meals is very pernicious and is a most common cause of loss of appetite. Chaney has shown that the taking of milk in the midmorning in school by underweight children, as compared with the taking of a glass of orange juice, gave poorer results with the milk. This was probably because the milk interfered with the appetite for the noon meal.

Starches and sweets have been thought to reduce appetite. If so, it is possibly because they flood the blood with available carbohydrates and thus in some chemical manner affect appetite. Protein and meat extractives are supposed to stimulate appetite. Other foods with savory or appetizing odors have a similar effect. Fresh air and exercise have a beneficial effect. Exercise burns up calories. A period of rest should intervene between strenuous exercise and a meal. Cod liver oil, vitamins, and ultraviolet rays increase appetite. Cod liver oil, however, in some cases causes anorexia and is not beneficial to appetite. Tonics, Carlson has pointed out, have no effect on hunger. In children their use is very disappointing. Sometimes prescribing a drug does psychic harm.

Overfeeding is detrimental to appetite. The appetite preferably should never be completely satisfied. Meals should be finished hungrily. Aldrich mentions a silver fox breeder who instructs his men immediately to reduce the ration of any animal which does not devour his food hungrily and forage around for more after his meal. He has found that by so doing the ultimate amount of food eaten is increased.

No discussion of training in eating would be complete without a consideration of anorexia, its causes and treatment. Numerous factors in the technic of feeding will be brought out in connection with this discussion. Literature is more abundant on the subject of loss of appetite, as this symptom is being presented increasingly within the last number of years. I shall quote fairly liberally from some of the recent literature on this subject.

Anorexia, occurring just beyond the age of infancy and at the preschool age, is so frequently complained of by parents that serious consideration of the problem is merited. Lowenburg of Philadelphia states that these cases constitute one-half or more of all ambulatory cases brought for examination. Bartlett found this to be the chief symptom in 24 per cent of out-patient children coming to the clinic. Ramsey says "these cases of anorexia form a very large part of the pediatrician's practice." Abt says "no subject in pediatrics is more important than anorexia." Porter thinks the problem has not very much to do with the child but is a matter of education of the mother. Schultz thinks that Bartlett's figure of 24 per cent is very low and that a much greater percentage represents the number of cases of anorexia appearing for treatment.

Anorexia can be divided into two main groups, organic anorexia in which a definite possible cause can be determined, and functional anorexia in which no apparent organic cause exists. The latter condition is much the more frequent. Admittedly anorexia is a symptom and not a disease, and our first duty is to search for the underlying cause. This task is so difficult at times that one is almost discouraged. However, after obtaining a careful history of the case and making a thorough examination the cause often becomes apparent.

The fact that anorexia seldom occurs in infants during the nursing age raises the suspicion that psychic and abnormal environmental factors play an important part in many cases. One or both parents may be nervous, hysterical, egotistical or present some abnormal or undesirable mental characteristics. Very commonly there are no other children in the family and the child has had too much attention and solicitation with too much emphasis placed on minor feeding disturbances. In infancy a foundation is laid and a bad atmosphere created. "The child is brought up from infancy in an atmosphere of promises, threats, pats, smacks, scoldings, bribings, etc." Too constant supervision and attempts to suppress the child's personality may even lead to the development of negativism. The mother becomes distracted and doubles her efforts with still worse results. Many of these children are well developed and in good health.

(To be concluded)

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# INFANTILE TETANY

## REPORT OF TWO CASES DEVELOPING ACTIVE SYMPTOMS WHILE RECEIVING VIOSTEROL *

Norman Ward Clein, M.D.
SEATTLE, WASH.

A voluminous literature has developed within the past few years relative to the laboratory and clinical manifestations of activated ergosterol (viosterol). Viosterol has been generally and universally accepted as a specific in conditions involving hypocalcemia, especially rickets and tetany.

There is still some dispute as to the dosage. No mention has been made in the literature of cases in which active tetany has developed while the patients have been receiving prophylactic doses of activated ergosterol prior to the onset of symptoms. A. Hess[1] and coworkers report a case in which a premature infant developed rickets while receiving large daily doses of activated ergosterol. Another observer[2] reports craniotabes developing in an infant while receiving supposedly adequate doses of viosterol, although this subsequently disappeared while the patient continued to take the same daily dose.

Variations in individuals, climate and preparations of viosterol undoubtedly influence the actions of supposedly adequate prophylactic doses of this drug. Two cases are presented, both having had viosterol daily from two to seven months respectively prior to the onset of active tetany. Both cases were relieved and cured very quickly by increasing the dose to that which was required by the individual infant. This observation surely merits further study regarding the action of viosterol.

Case 1. L. M., boy aged 20 months. He was the second child, a forceps delivery, otherwise being normal, birth weight 8¾ pounds. He was breast fed two months and received Eagle brand milk subsequently until the sixth month. He was receiving undiluted raw milk up to the time of his first examination at seven and one-half months. He had received cod liver oil from three months of age in increasing amount until two teaspoonsfull daily were being taken.

At seven and one-half months he was brought in for examination because he had no teeth and could not sit alone. He had had frequent colds, poor appetite and was constipated. The mother also stated that he could not swallow well and had his tongue out all of the time. She wondered if his brain was normal.

Physical examination revealed a fat, flabby, pale but mentally alert infant, weighing 19 pounds. His sight and hearing were normal. A rachitic rosary, Harrison's groove, bosses, large fontanelle, 60 per cent hemoglobin and roentgen-ray examinations showed definite signs of rickets. Fluoroscopic examination showed a moderately enlarged

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* Read before the Annual Meeting of North Pacific Pediatric Society, Seattle, Wash., June 12, 1930.

thymus. The tonsils were large and cryptic. Treatment consisted of viosterol, 10 drops daily, cow's milk with two egg yolks daily, cereals, vegetables and beef juice. Sun baths were suggested.

When nine months old he had two teeth, sat up, was bright, had a good appetite, slept well and crawled around in the play pen. The active signs of rickets had disappeared. From the age of nine to fourteen and one-half months he progressed well except for abscessed ears on two occasions. He had thrush at eleven months of age. At one year he was given toxoid and was vaccinated. He had been receiving ten drops of viosterol daily, given directly into his mouth for the past seven months.

On January 25, 1930, when fourteen and one-half months of age he began to hold his breath and have blue spells when excited or angry. A few days later he began to stiffen out for a few seconds and his eyes rolled backward, following the blue spells. Examination at this time was normal except for chronic infected tonsils and swollen gums over the first molars. Fluoroscopic examination showed an enlarged thymus as previously seen. This was treated by a strong dose of roentgen rays. He seemed quite well for the next two weeks when he developed tonsillitis. At this time he fell from a chair and held his breath, became blue and had a tonic convulsion. He was very tired for the rest of the day.

Examination showed follicular tonsillitis, temperature 103° by rectum. Chvostek's sign was very positive. The thymus appeared normal. Blood chemistry was calcium 7.6, phosphorus 4.3. He was given twenty-five drops of viosterol daily and 6 grains of calcium chloride three times a day. Four weeks later he felt much better, although the Chvostek's sign was still positive.

When last seen, July 1, 1930, when 20 months old, he weighed 29 pounds, was 35½ inches tall. He was active, happy and had eight teeth. His fontanelle was closed and there was no Chvostek's sign. Roentgen-ray examination showed his long bones having heavy dark epiphyses. The thymus was normal. Blood calcium 11.5, phosphorus 7.7. He is now receiving viosterol, twelve drops daily, and calcium chloride grains six twice daily, and a very full diet.

Case 2. B. A., girl, age 3½ years. She was a normal birth, first pregnancy, weighing seven and one-half pounds. She was breast fed five and one-half months and then received a milk, water and dextrimaltose formula. Her diet the first year was an average one. She received cod liver oil beginning at six months in quantities, averaging one teaspoonfull daily during her second winter. Her development and habits were normal. She had several slight colds and a convulsion occurred, associated with high fever when one year of age.

At two years of age, when first examined, she was normal for height and weight, well developed and a healthy happy girl. She was of the high tension, neurotic type. For the next fourteen months her development was uneventful with the exception of two attacks of croup. She had gained nine pounds.

At thirty-eight months of age a convulsion occurred about 6:30 in the morning, of a sudden onset, no aura of any kind, generalized and lasted for ten minutes. The child slept for one-half hour, awakened, ate her breakfast and played out of doors with her playmates, feeling perfectly well. At the suggestion of a kindly neighbor she was given a thorough worm treatment. Two weeks later she had a second convulsion, coming on suddenly at 7 a.m., as the child was arising. This was also generalized and lasted ten to fifteen minutes. There were no involuntaries.

At this time the examination was essentially normal. Her mother stated that the child had recently become very irritable, fretful, cried easily and went into tantrums readily. She played hard all day, went to bed at 7 p.m., but never fell asleep until 9:30 or 10 p.m. The mother stated that she had seen live pin worms in the stools, although subsequent examinations by the laboratory failed to reveal worms or ova. She was given treatment for the worms and at the same time calcium chloride 6 grains twice a day and viosterol 15 drops daily. After two weeks this was reduced to calcium chloride once daily and viosterol 10 drops daily.

At forty months (two months later) the child seemed well except for being very nervous for the past month. She had a third severe generalized convulsion, lasting one-half hour, and occurring before her breakfast. Physical examination was apparently normal; temperature was normal; the blood calcium was 8.7, phosphorus 5.2. Inasmuch as she had been receiving calcium chloride and viosterol daily for the past six weeks the dosage was increased to thirty drops of viosterol once a day and six grains of calcium chloride four times daily. This was continued for one month and for the subsequent two months to the present she has been receiving twenty-five drops of viosterol daily and six grains of calcium chloride twice a day, in addition to quartz light treatments twice weekly. Blood calcium, taken July 7, was calcium 13.0, phosphorus 6.8. The child has been greatly improved. Her nervousness has disappeared. She sleeps soundly. Her appetite is good and she is brighter in every way.

The first case represents one in which there was a definite history of rickets treated according to accepted methods. Although he received the prophylactic dose of viosterol advised by the Steenbock committee, he developed real tetany. The second case, having no history or physical findings of rickets, developed a condition of tetany as evidenced by the blood picture.

The dosage of viosterol recommended by the Steenbock committee is eight to ten drops daily when used as a prophylactic. There has been a hesitancy in giving larger doses on account of numerous reports of toxic symptoms which had developed. Holtz[3] has demonstrated that giving doses one hundred thousand times as large as the therapeutic dose to animals has caused them to gain less and slower than normal animals. At postmortem he demonstrated a calcification in the kidneys, lung and aorta, but not in the heart, liver, spleen or suprarenal gland. He states that this may be due to other chemicals present which are known to produce similar effects, i.e., aldehydes, lactic acid, pyruvic acid, hydrogen peroxide and benzoyl peroxide. Borgi[4] believes that the toxicity observed after giving excessive doses of irradiated ergosterol was not due to vitamin D but to the presence of toxic substances associated with it.

Moore,[5] in a carefully controlled group of infants, recommends doses of twenty drops daily to be adequate in preventing rickets in infants in the Pacific Northwest. He claims that it is almost impossible to give enough cod liver oil to prevent or cure rickets in this section of the country. My own experience, after using viosterol for the past two years in over three hundred infants, is that the doses as recommended are too low for those in this district. I have found that twelve to twenty drops daily are necessary to prevent the manifestations of rickets in healthy infants. To date there has been no apparent clinical difference in the physical condition, mental development and general well being of the infants while taking viosterol than those that have received cod liver oil.

Several authors claim that viosterol does not prevent rickets as efficiently as cod liver oil given in equal doses. DeSantos and Craig[6] came to this conclusion. After feeding infants ten drops of viosterol or three teaspoonsfull of Norwegian cod liver oil daily, they found that in the viosterol cases 23 per cent developed rickets, while in the cod liver oil group it was only 3 per cent. They state that either the equivalent of units of viosterol are less active than those of cod liver oil or factors other than vitamin D are responsible for the greater percentage of rickets. Similar reports are made by Barnes[7] who stated that viosterol prevented rickets in only 44 per cent of his cases, while cod liver oil was effective in 95 per cent. Therefore, he felt that we were not justified in considering rat units of vitamin D in cod liver oil as a curative or prophylactic remedy for rickets. From the reports mentioned previously it can readily be seen that there is a great difference of opinion among observers as to what is an adequate prophylactic dose of irradiated ergosterol.

Normally the calcium and phosphorus values, as determined by the Clark modification of the Kramer-Tisdall and the Tisdall methods, respectively are:

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|---|---|
| Calcium | 10 to 10.5 mg. per 100 c.c. of serum |
| Phosphorus | 5.5 to 6 mg. per 100 c.c. of serum |

In tetany the calcium is always below this level, although the phosphorus may or may not be low. High phosphorus concentrations have been reported.[8]

In treatment of tetany with viosterol Bakwin[9] reports that the serum calcium became normal in the average case within seven days on the daily dosage of 4 mg. of viosterol. This is contrasted with an average of fourteen days using ultraviolet treatment in his series. Other observers have stated that it takes an average of seven to twenty-one days to cure rickets with viosterol, which is much shorter than the time required with cod liver oil.

## SUMMARY

Irradiated ergosterol (viosterol) has proven to be a specific in the cure of rickets and tetany. On account of the relatively short time which this product has been available since the discovery in 1924 by Steenbock, there naturally arises a great difference of opinion as to the necessary dosages. The future will undoubtedly reveal many weaknesses and fallacies in our present interpretation of the action of this drug. The cases presented bear out these predictions.

One could easily feel safe while treating an infant according to the standard methods, and yet have such a condition as reported develop, while the infant is under constant medical supervision. This again brings out the fact that every infant must be treated individually. We cannot and should not prescribe the same dose[10] of viosterol for every infant any more than a scientifically trained physician should try to feed all babies on the same food. Not much attention has been given to the section of the country having a bearing on the dose of viosterol required. This needs further study.

## CONCLUSIONS

1. Two cases receiving "adequate" prophylactic doses of viosterol for two and seven months respectively developed symptoms of tetany.
2. Both cases responded readily by increasing the dosage over that which they had been receiving.
3. The prescribing of viosterol or cod liver oil should be that required by the individual after regular periodic physical examination.
4. Further studies in this subject are indicated.

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# EDITORIAL

## THE CONTRACT PROBLEM

No subject has elicited so much discussion and controversy of late among the profession of Washington and Oregon as has that of contract practice. The contention seems to center chiefly about the distribution among physicians in general of the work under the Departments of Labor and Industries. There is little criticism of the fees paid by these departments, the compensations being considered fair, all conditions considered. The rub is that these fees are not equally obtainable among the profession nor do those performing the services always receive the full compensation which is provided for this work. The contract abuse appears chiefly under two forms. Certain groups of physicians, ordinarily designated as clinics, have succeeded in corralling the practice among leading industries and manufacturing concerns to the exclusion of the individual practitioner, often bridging large sections of the state with branches in numerous towns and cities. The most objectionable phase, however, is found in the hospital associations, commonly controlled and operated by laymen, and often emanating from alien states, which have succeeded in capturing many industrial contracts, doling out the actual treatment of patients to certain physicians who receive for their services only a percentage of the fees paid out by the state, the balance going to the promoters of the associations. The problem is further complicated by the statement that reliable figures often show better results from private contracts and hence less expense to industry.

These much-debated problems received a great deal of consideration in state association meetings which were held last month. It was interesting, in observing the discussions in the Houses of Delegates of the two states, to note the identity of the problems presented by each. The age-old question naturally arises, what are you going to do about it? It seems as if some progress may be in sight in the action taken by the Washington association. In that state the dissatisfaction of the situation has extended outside of the medical profession to the grange and labor unions. It is reported that their representatives have in hand a measure to be presented before the next session of the legislature, abolishing all medical contracts as now executed and giving the individual workman the right to select his medical attendant. After a prolonged discussion before the Washington House of Delegates, a resolution was passed favoring abolition of existing contract practice and placing this work directly under the Department of Labor and Industries, giving to the employe his choice of physician. It was specified in the resolution that all medical contracts, lodge insurance and health contracts be placed likewise under this department for greater safety of the insured. Since the gauntlet has thus been thrown down against the existing forms of contract practice, the field should be open for a thorough discussion on the part of all physicians and others interested in this subject. Then by the time the next legislature is in session, something concrete might be devised for presentation with the hope that the present dissatisfaction with existing conditions may be relieved and others substituted which may be more acceptable to employers, employes, and medical attendants.

## REPORTING VENEREAL DISEASES

Doctors of Washington are neglecting one very important condition, that venereal diseases are by law reportable, as are smallpox, diphtheria and other infectious diseases. The report is made by a number and not by name. The physician withholding the name is legally held responsible for the patient continuing under treatment until well. If the patient discontinues treatment prematurely, the law makes the very exacting provisions as follows, which are similar to the statutes of other states:

Washington Session Laws of 1919, Chapter 114, Sections 1 to 8, in paragraph (f) of the State Board of Health regulations, provides as follows:

"Whenever any person suffering from syphilis or gonorrhea or chancroid infection, who has been under the care of any physician, goes to another physician for treatment, he or she shall inform the second physician of the name and address of the physician under whose care he or she has been, and if known, the name, initials or number under which his or her case has been reported to the health officer. The physician to whom such infected person applies for treatment shall immediately report the case to the health officer having jurisdiction, in the same manner as though he or she had not been treated by another physician, and in addition he shall indicate the name and address of the previous attending physician, and if known, the name and serial number under which the case was reported."

Forgetting the legal aspects, it is very much to the doctor's advantage to make reports when the diagnosis is made. It impresses the patient with the seriousness of the condition and necessity of continuing treatment. The patient gets one-half of the report blank and the doctor fills in and sends the other to the local health officer. The patient's portion tells what he can and can not do, and informs him that the report is by number, and no name mentioned. If he discontinues treatment, his name is then to be reported to the health officers.

The law requiring reporting is a good sound public health policy. It is best for the patient, in that it forces him to continue treatment, and is of economic advantage to the doctor, in that it gives him a hold on the venereals, a class notoriously negligent. Report blanks are supplied by the local health officer.

## A MEDICAL ASSEMBLY IN THE MOUNTAINS

Mountain scenery always has a fascination for dwellers in the lowlands. Rugged peaks, a majestic mountain with a perpetual mantle of snow ribbed with glaciers, beautiful small lakes, flowers found only at a high altitude, bracing atmosphere, all these are characteristics of Mount Baker Lodge, where Washington State Medical Association held its annual meeting last month. This unique hotel, with its spacious lobby, adorned simply with logs and unpainted timbers, presented an ideal setting for friendly intercourse and social contacts which were thoroughly utilized by a hundred and fifty members with their wives and guests. Perpetual sunshine and mild temperature attracted all to the out-of-doors, which was not conducive to continuous attendance at the scientific sessions. The attractive surroundings of this mountainous resort will provide lasting recollections for all visitors.

The arrangement for holding the scientific sessions in one end of the lobby, isolated only by a few suspended blankets, was not a success for undisturbed reading and discussion of papers. Nevertheless the program was an unusually good one, containing papers on vital topics which will prove of interest to all readers when later published. In addition to the valuable papers formally presented, the illustrated address at the dinner by Dr. C. B. Leake of University of California Medical School on the history of anesthesia was especially attractive. The speaker has a style and enthusiasm which is communicated to his hearers. The success and satisfaction of this annual dinner was enhanced by the skillful guidance of Walter Woodward, the incomparable toastmaster, whose inimitable yarns kept his audience in a gale of laughter. A pleasing feature of this occasion was the presentation of a token of affectionate regard by his many friends to Curtis Thomson, who has served as secretary of the State Association for twenty-five years, an impressive introductory address being delivered by John O'Shea.

The House of Delegates engaged in a prolonged consideration of affairs pertaining to the association's welfare, one morning being mostly devoted to the consideration of the contract problem. It is suggested that emulation of the plan of the Oregon State Society for holding sessions of its House of Delegates would be conducive to a better accomplishment of results and avoid conflict with the scientific sessions. Their procedure is to hold a meeting of the House in the morning in conjunction with a 7 o'clock breakfast. This provides several hours for consideration of business of the organization before opening of the scientific session. It has proven so successful and satisfactory with its southern neighbor that it would be quite worthwhile for the Washington Association to consider its adoption.

## THE PORTLAND ANNUAL MEETING

The recent annual meeting of the Oregon State Medical Society at Portland was replete with interest both from scientific and social standpoints. One who has been accustomed to attend these meetings for the last quarter century is greatly impressed by the disappearance of the forceful and prominent group who formerly headed the activities of this organization. Only a few of the old guard continue to function. The places of these former distinguished members are being filled by a group of brilliant new practitioners, whose acquaintance it is a privilege to make and whose presence is an honor to any medical organization. Instead of holding meetings of the society in a hotel or public building, as has been customary in the past, the sessions were scheduled in the auditorium of the Medical-Dental Building, in proximity to the rooms where all the society activities function during the year. Thus all members were given the privilege of inspecting their society's activities and familiarizing themselves with the workings of their organization.

The program of papers was an ideal one for a state society, in that the papers were presented exclusively by the members. More interest could not have been shown had leading representatives of the profession been featured from southern and eastern cities. It is a great advantage in a state society that its members are capable of presenting such a group of papers on vital subjects that are engaging the attention of leaders of the profession. It is hoped that most of these papers may be published in this journal for the enlightenment and benefit of its readers.

One interesting feature of the meeting was an address by Dr. W. B. Coffey of San Francisco who was visiting the city in response to a request on the part of groups of business men that he establish a clinic for the administration of the Coffey-Humber cancer remedy. Since such a project would demand the services of local physicians, it had been considered by a group of them who had agreed to undertake to employ this treatment, provided it should be exclusively under their jurisdiction and be subject entirely to their observation and report of results. These conditions were said to be unacceptable to Dr. Coffey. He is a man of forceful personality who presents his subject with great vigor and with an authoritative aspect. These characteristics are probably to an extent responsible for the degree of acceptance which has accompanied the publicity of the Coffey-Humber cancer treatment. His address before the society was devoted to an attempted vindication of his attitude regarding this method of treatment. Many condemnatory letters were read with others to demonstrate the inconsistencies of his critics. It is no invidious comment to state that his auditors did not appear convinced or enthusiastic over the alleged beneficial effects following the application of this treatment to cancer patients.

One of the pleasing features of this and all of the state meetings in this section is the spirit of cordiality and friendliness evident among the physicians of these adjacent states. No visitor from one state to another is a stranger. Friendly greetings and warm expressions of appreciation are universally observed, regardless of the state in which the various men reside. This is a pleasing indication of the increasing solidarity of the medical profession of this country.

## MEDICAL NOTES

New Journal Officials. The House of Delegates of the Washington State Medical Association, at its annual meeting last month, elected the following trustees for Northwest Medicine: Drs. C. E. Hagyard and H. C. Olmsted of Seattle, and C. J. Johannesson of Walla Walla. At the annual meeting of the Oregon State Society the journal trustees from that state appointed Dr. W. H. Buermann of Portland as associate editor to replace Dr. William House, deceased. At the annual meeting of the Idaho association, held in Coeur d'Alene, Dr. H. W. Stone of Boise was elected secretary of the association, who thus becomes assistant editor from that state in place of Dr. J. N. Davis. The trustees of the Idaho association appointed Dr. Alexander Barclay, of Coeur d'Alene, associate editor.

### OREGON

Opening of Medical School. The University of Oregon Medical School opened its fall term October 2. The entering class is limited to sixty members, although three hundred applications were received. The total number of students will number about three hundred. The construction of the new clinic building is progressing rapidly. This was made possible by a gift of $400,000 from the Rockefeller Foundation. The medical school has a staff of one hundred and forty-two members with fourteen full time professors, the others being practicing physicians of Portland.

Cancer Clinic Offered. Dr. W. B. Coffey, chief surgeon, Southern Pacific railroad, last month offered to install a clinic in Portland for the treatment of cancer according to the Coffey-Humber procedure. He stated it would cost $25,000 to operate it without profit. He stated that the glands from sheep for making the extract cost three dollars a pound and it requires fifteen hundred pounds to make ten c.c. of the extract. He claimed that seventy per cent of the cases were releieved of pain, accompanied by sloughing of th cancer cells and an improvement of the general health. As far as known such a clinic has not yet been established.

College Epidemic. Last month an epidemic of acute intestinal disturbance occurred among a large number of students at Reed College, Portland. While there were no fatalities, the number of patients was large. After many theories were offered in explanation, Dr. William Levin, state bacteriologist, has determined that the etiologic factor was an ingredient of cream date pie, with dates probably responsible as a carrier of the infection.

Board of Health Annual Meeting. Preceding the annual meeting of the state medical society at Portland, there was a conference of state and county health officers which presented a two days' program, September 16-17. Problems of public health protection were discussed, covering purification of water, safeguarding of milk supplies, lowering of infant mortality, periodic health examinations and preventive medicine, prevention of tuberculosis and general health education. Papers covering these subjects were presented by officers of the state department of health, professors of the University Medical School and health officers.

New Hospital Planned. It is proposed to build a community hospital at Hood River, for which plans are being prepared. The new structure will cost about $40,000. Its construction depends upon provisions that it shall never pass into the hands of a religious sect, but shall remain a community hospital. Since it will be located above the city water supply, provisions will be made for cast-iron sewers and other protections to prevent contamination of the water.

New Hospital Contemplated. It has been announced the staff of physicians and surgeons, composing the Portland Medical Hospital, have purchased a site on Marquam Hill, south of the Veterans' Bureau Hospital, where a new hospital will be constructed. It will cost $100,000, and contain seventy-five beds. Construction work is to begin in the near future.

Improvements to Hospital. Improvements to St. Joseph's hospital at Vancouver have been completed, including the addition of new rooms and balconies, with other additions to enhance the efficiency of the institution.

Jackson County Medical Society held its first fall meeting at Medford, September 3. After dinner at the Medford Hotel, case reports were presented and discussed. Dr. R. W. Stearns of Medford read a paper on "State Medicine."

Compliment to a Veteran. On Aug. 28 the friends of Dr. John F. Dickson of Portland, tendered him a complimentary dinner in honor of his seventy-firth birthday. Forty-three of his associates in the Pacific Coast Oto-Ophthalmological Society were present.

Dr. H. J. Kavanaugh of Pendleton has returned after an absence of five months, during which time he spent two months of study in Vienna. He was impressed with the prosperous appearance of the people in many parts of Europe, but the unemployment situation in England was very depressing.

Dr. G. P. Winchell of Eugene has returned home after several months absence, during which he spent considerable time in Vienna, visiting the Passion Play at Oberammergau.

Dr. C. H. Phetteplace, who has practiced during the last three years at Springfield, has located for future practice at Eugene, where he will be associated with Dr. H. M. Peery.

Candidate for Mayor. Dr. Frederick Thompson of The Dalles, who is now serving as state health officer, is a candidate for mayor at the coming election. The present incumbent is not seeking reelection and has enthusiastically endorsed Dr. Thompson.

Dr. E. L. Bywater of Grants Pass has returned to the practice of medicine. He has resided several years in that city, where he formerly practiced for a period of years.

Physician to the University. Dr. Mark T. Phy of Hot Lake has located in Eugene, where he will become University of Oregon physician. He will also devote time to research work.

Dr. Leslie L. Nunn, formerly of Portland, has located for practice at Vancouver after spending several years as resident physician at the Mayo Clinic.

## WASHINGTON

Public Health Convention. Following the annual meeting of Washington State Medical Association at Mount Baker Lodge last month, public health officers of Washington held a two days' session at Bellingham. About fifty physicians were present, led by Dr. A. E. Stuht of Seattle, director of the State Department of Health. Besides discussions dealing with public health problems and administration, there were considerations of recommendations for changes in the state code which may be presented at the session of the next legislature.

Visit From Former Health Officer. Last month Dr. Joseph P. Kane, who practiced for many years in Tacoma and later was health officer of Walla Walla city and county, paid a visit to this section. He is now connected with the American Public Health Association with headquarters in New York City. He is a member of the committee on administrative practice, and is assigned to the health program of the United States Chamber of Commerce.

Disabled Veterans' Hospital. Somewhere in the Northwest the government will establish a national home for disabled volunteer soldiers, for the construction of which $2,000,000 has been appropriated. It will house 2,000 veterans, with a staff of four or five hundred people. Several cities in Washington are striving vigorously to be selected for the location. Among these Yakima and Longview are especially active, while other cities are agitating the question. Perhaps it will be located in some other state than Washington.

Bellingham City and County Health Program. The officials of Bellingham have been laboring industriously for some time to secure a city-county health officer. Last month Dr. H. J. Green of Seattle accepted the appointment. Within a few days he tendered his resignation. A similar experience occurred shortly before that with Dr. J. W. McDowell of Seattle. Therefore, the present situation remains unchanged with Dr. Marion LeCocq as county physician and Dr. I. W. Powell as city health officer.

New Hospital Established. A new hospital has been established at Bremerton under the auspices of Kitsap County communities. It will be a combination hospital and home for the aged with accommodations for about thirty patients. It will be known as Sunnyvale Hospital and has been constructed at a cost of about $30,000.

New Hospital Superintendent. Mrs. Cecile Tracy Spry has been appointed the superintendent of Everett General Hospital. She has recently been superintendent of Hahnemann Hospital in Portland, and previous to that superintendent of nurses at Tacoma General Hospital.

Visit From an English Lord. Last month His Majesty King George's physician, Lord Dawson of Penn, made a brief visit to Seattle, where he spent a few days. The immediate object of his presence in this locality was to visit two brothers living in Wenatchee. This physician has obtained world-wide publicity in connection with the late illness of King George.

**Dr. John K. Stewart** has located for practice at White Center, after having practiced for several years at Hoquiam.

**Pacific Coast Oto-Ophthalmological Society** held its annual meeting in Victoria, B. C., September 3-4. An extensive program was presented, containing papers by specialists from the cities of California, Oregon, Washington and British Columbia. A wide range of subjects were considered in the papers and discussions.

**New Athletic Physician.** Dr. H. J. Green, recently from the University of Nebraska Medical College, has been appointed physician for athletics at the University of Washington.

**Dr. W. E. Tupper** has located for practice in Seattle, coming there from Laurel, Mont., where he has practiced for a number of years.

**Dr. N. M. Bellas,** recently from Salem, Ore., has located in Wenatchee, where he will be associated in practice with Dr. E. J. Whidby, who is mayor of the city.

**Dr. Robert E. Mullarky** of Seattle, who has taken postgraduate work in the East since last April, has sailed for Europe, where he will pursue studies in pathology and surgery in London, Prague and Vienna. He expects to return home to resume practice in the spring.

**Dr. and Mrs. John W. Unis** are receiving congratulations on the birth of a son, John Waldemar, Jr., Tuesday, September 23, at the Swedish Hospital.

**Dr. F. A. Black** of Seattle has returned home after a year of travel and study. With his family he sailed westward on a circuit of the globe. He relates many interesting experiences among strange and unfamiliar people. The latter part of his absence was devoted to study, chiefly in England and Germany.

**Dr. Albert Knudtson** of Seattle has been abroad several months, pursuing studies in the medical centers of Europe.

**Dr. J. A. Weber** of Seattle has recently left for a course of eight months of study in ear, nose and throat work which will be carried on in Vienna.

**Dr. F. W. Jones** of Bremerton has left for several months study in Europe, which will be chiefly spent in Vienna and Budapest.

**Dr. Donald G. Corbett** of Seattle has left for six months study of urology in Vienna and Berlin.

**Dr. J. M. Wooodward,** who has been stationed for the past three years on the staff of the hospital at the Navy yard at Bremerton, has been transferred to the naval station at Guam.

**Dr. Thomas Runnals,** who has recently practiced in Puyallup, has located in Orting. He formerly practiced in this city where he served as health officer.

## IDAHO

**Working for New Hospital.** It is hoped that the new National Veterans' Home, which will be constructed at a cost of $2,000,000, may be located at Coeur d'Alene. The Idaho U. S. senators and Congressmen are working for this purpose and the interests of the state seem to be united on this location for the institution.

**New Hospital Superintendent.** Pocatello General Hospital receivd its new superintendent last month. She is Miss C. Lasser from San Diego where she has recently been in charge of the General Hospital of that city.

**New Hospital Needed.** There is agitation for the construction of a hospital for Fremont county to be located at St. Anthony. There is no such institution in that region. This city thought the population of the county would justify a sixty bed hospital which it is believed could be made self-supporting.

**New Hospital Opened.** A new hospital has been opened at McCall with Mrs. Kay Cotter, registered nurse, as superintendent. All physicians of that locality are privileged to send their patients to this institution for treatment.

**South Side Medical Society** held a joint medical and dental meeting at Park Hotel, Twin Falls, Sept. 26. The program comprised a paper on "Vincent's Angina," by Dr. E. L. Berry and R. G. Inset. Also "Focal Infections," by Drs. J. H. Murphy and F. F. McAtee.

**Wedding.** Dr. Arlo A. Morrison of Buhl was married to Miss Marcell Tillery of that city September 7.

## OBITUARIES

**Dr. Daniel P. Love,** of Junction City, Ore., died at Portland August 25, aged 63 years. He was born in Tennessee and came to Oregon in his boyhood, living in Albany and Lebanon. He graduated from Lincoln Memorial University Department of Medicine, Knoxville, in 1890. He practiced in Junction City for twenty years. He served in the World War, retiring as captain, and was later surgeon of the Southern Pacific Railway Company.

**Dr. W. F. Oliver,** of Arlington, Wash., died at Seattle August 24 from chronic nephritis, aged 71 years. He was born at Bloomington, Iowa, in 1859, spending his childhood at Ladoga and Indianapolis, Ind. He obtained his medical education at the Medical Department of the University of Illinois. He practiced at Longton, Kansas, where he also served as county superintendent of schools. He came to Washington in 1889 and located at Cicero, later residing at Buenna. For the past thirty years he has lived at Arlington.

**Dr. Oscar E. Bloom** of Akron, Ida., died August 24 as a result of disease of the heart, aged 51 years. He was born in Aurora, Indiana, and graduated from the University of Cincinnati Medical College in 1910. During the World War he served as lieutenant in the medical corps. He formerly practiced at Richfield, but for the past six years had been located at Akron.

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**Toilet Water Dermatitis.** J. E. Lane and M. J. Strauss, Conn. (*Journal A. M. A.*, Sept. 6, 1930), describe a peculiar dermatitis which has received but little attention in the American or English medical literature but has been frequently described by German, French and Italian dermatologists. Most of the reported cases have been due to the use of eau de cologne. The condition is known as berlock dermatitis (Rosenthal), dermite pigmentée en forme de coulée (Du Bois) and dermatitis des rinneden tropfens (Stein). A typical case of this eruption due to a preparation other than eau de cologne is reported.

# REPORTS OF SOCIETY MEETINGS

## WASHINGTON STATE MEDICAL ASSOCIATION

### MINUTES OF THE FORTY-FIRST ANNUAL MEETING OF WASHINGTON STATE MEDICAL ASSOCIATION, HELD AT MOUNT BAKER LODGE, WASHINGTON, SEPT. 2 AND 3, 1930.

The forty-first annual meeting of Washington State Medical Association was held at Mount Baker Lodge, Sept. 2-3, 1930.

### THE HOUSE OF DELEGATES

#### First Session

Tuesday, September 2

The first meeting of the Board of Trustees and the House of Delegates was called to order by the President, Dr. Cleveland, at 9:00 a. m. On calling the roll a quorum was found present, the following delegates being present:

H. E. Cleveland, A. E. Anderson, J. R. Morrison, C. H. Thomson, J. H. O'Shea, S. L. Caldbick, D. C. Hall, D. H. Houston, Geo. Anderson, Elmer Hill, H. E. Rodehamel, J. T. Rooks, Frederick Epplen, D. E. McGillivray, J. E. Gahringer, H. G. Miller, O. R. Austin, Roger Anderson, C. E. Hagyard, C. W. Shannon, H. E. Coe, J. T. Dawson, Oscar Proctor, A. H. Peacock, W. C. Speidel, E. W. Young, D. A. Nicholson, P. V. von Puhl, F. A. Bird, F. W. Anderson,, H. G. Willard, W. B. Penney, W. D. Read, C.· L. Hoeffler, E. C. Leach, A. A. Matthews, R. N. Hamblen, S. S. Oppenheimer, S. E. Lambert, C. J. Johannesson and W. A. Hulbrush.

Motion was adopted to accept the minutes of previous session as published in the Journal, Northwest Medicine.

The Secretary-Treasurer presented the last audit of his accounts and it was accepted and ordered published in the Journal.

#### Financial Report

To the Officers and Members, The Washington State Medical Association, Seattle, Washington.

Gentlemen:

In accordance with your request, we have audited the books of the Washington State Medical Association for the six months ending June 30, 1930, and now present our report. As a part of this report, we have prepared and attach herewith the following Exhibits:

| | |
|---|---|
| Medical Association Fund | Exhibit A |
| Legal Defense Fund | Exhibit B |
| Disbursements M. A. F. | Exhibit C |
| Disbursement L. D. F. | Exhibit D |
| General Receipts | Exhibit E |
| Recapitulation Statement | Exhibit F |

While these exhibits will, we believe, give you all the essential information, we would make the following comments:

#### Medical Association Fund

Receipts from membership dues for the period have amounted to $4,249.00, being remittances from 850 members; 795 of these were for 1930, 49 for 1929, 6 for 1928, and 2 for 1927. The amounts were satisfactorily reconciled with the remittance blanks from the Secretary-Treasurers of the various constituent Societies. We have also credited this Fund with interest upon investments in proportion to the balance to the credit of this fund at January 1, 1930, as shown by Exhibit E $152.25, making a total in receipts of $4,401.25, credited to this fund. Disbursements from this fund have amounted to $3,291.23, as shown by Exhibit C, therefore, showing an increase in this fund of $1,110.02. This amount, added to your January 1 balance of $6,763.80, gives you a balance of $7,873.82 to the credit of this fund at June 30, 1930, as shown by Exhibit A.

#### Legal Defense Fund

Receipts from subscribers to this fund have amounted to $2,690.00, or 269 subscriptions for the period. We have credited this fund with interest upon investments in proportion to the balance in this fund at January 1, 1930, as shown by Exhibit E, $400.87, making a total in receipts of $3,090.87. Disbursements for this period have amounted to $2,052.48, as shown by Exhibit D, a net increase in receipts over disbursements of $1,038.39. This amount, added to your January 1 balance of $17,804.77, gives you a balance of $18,843.16 to the credit of this fund as at June 30, as shown by Exhibit B.

#### Recapitulation Statement

This Exhibit shows total Receipts from all sources of $7,497.12 and Disbursements of $5,348.71, a net increase of Receipts over Disbursements of $2,148.41 for the period. This amount added to your January 1 balance of $24,568.57, gives you a balance of Cash and Securities in the hands of your Treasurer of $26,716.98, as at June 30, 1930, this balance being made up as shown by detail list attached to this Exhibit.

#### General

The Bank Balances have been satisfactorily reconciled with statements from the Depositories. The bonds were inspected by us, except three American Telephone and Telegraph Co., which are covered by a temporary receipt, all unpaid coupons being attached to the bonds.

All disbursements have been made by voucher check, drawn on your regular depository, have been properly endorsed and cleared through the bank in regular order. Invoices from parties to whom payments were made are properly O.K.'d by the President of the Association and are on file, or payments authorized by your minutes or By-Laws.

#### Certification

We Hereby Certify that the attached Exhibits, together with the foregoing comments, all in agreement with your books, and in our opinion are correct, and show the true status of the two funds at June 30, 1930, and the correct amount of Receipts and Disbursements for the six months ending that date.

Respectfully submitted,
Louis E. Smith & Co.,
Certified Public Accountants.
(Signed) By Louis E. Smith, C.P.A.

#### Report of Social Hygiene Committee

Dr. W. R. Jones then presented the report of the Social Hygiene Committee.

The Social Hygiene Committee claims no particular credit for work done during the past year. It was appointed in April, when the organizations through which most work could be done were winding up their year's program. The work left unfinished by the previous year's committee had been continued in the interim by the State Department of Health and Public Health League.

Last year's committee had left behind several written lectures with slide illustrations on the subject of general hygiene, bacteriology and physiology of the sexual organs. Good speakers, not members of the committee, both men and women, handled the addresses admirably. These talks were used in the Y. M. C. A., Y. W. C. A., high schools, grade schools and various social organizations. Approximately thirty-five such talks were delivered over the state.

One set of Brayco films on "The Science of Life," with a suitable lantern, was furnished by the U. S. Public Health Service. These films were complete, needing no speaker. They were just about worn out.

One thing particularly demanding attention is the organizing of a Washington Social Hygiene Society that will be controlled by the persons who would reflect credit upon the medical profession, and not be controlled by the vice hound type. This organization is coming and, unless we meet it properly, there may be just a little more socialized medicine.

Some of the things we learned and which are still demanding attention are:

1. There is a very definite need of some place where the young people can learn the physiology of the sexual organs. They will get the information some place, and the doctors ought to be the ones to supply it.

2. Abortion business is no longer an infant industry, nor is it in the hands of medical doctors.

3. The age of the first sexual experience has markedly decreased in the last years with resulting increase in venereal disease, illegitimate pregnancies and abortions.

4. Syphilis is on the decrease, while gonorrhea is very much on the increase.

5. The number of brothels and prostitutes has increased markedly of late.

Big business has invaded the brothels with standardization and systematization to the extent of open advertising by distinctive signs, and giving their medical business by contract, though not covered by the medical aid law.

We believe that the brothels are honestly trying to reduce venereal disease, and consider having one regular examiner as the best means of reducing them. It is good sound business for them.

Attention of officials was called to this condition, and the answer was that there is not a law prohibiting a physician contracting to diagnose and treat venereal accidents any more than industrial accidents. Health officers commented that one regular examiner ought to reduce venereal disease.

No official action was taken by this committee on the subject, and it is merely brought to your attention as another step towards socialized medicine at the place where we thought it least likely to occur.

We have, as in times past, religiously confined our work to education and now find that perhaps we have also educated the people too much, though not too well.

On motion the report was accepted.

### Report of Tuberculosis Committee

Dr. Charles R. Castlen then made the report on the Tuberculosis Committee as follows:

The work in tuberculosis has gone on very well during the past year, both from a public health as well as from a clinical point of view.

The State Tuberculosis Association, through its sale of seals, has done a great deal of work in the education of the public of the necessity of guarding against tuberculosis, as well as conducting numerous free clinics.

Various cities and counties have conducted free clinics for the examination and discovery as well as appropriate advice in tuberculous cases, with the follow-up system of the visiting nurses. A great deal of the success of this work is due to the physicians over the state who have given their time and effort to conduct these clinics, as well as giving numerous talks to parent teachers associations and school children.

In Spokane, under Dr. Frank Miller's direction, there were conducted twice during the year, two day institutes and clinics for physicians which were well attended and very successful. In addition a weekly clinic is held. A city nurse and county nurse do the follow-up work, and the patients are cared for at the Edgecliff Sanatorium under Dr. Miller.

At Elma, under Dr. Hull, free clinics are given. Patients are cared for at the County Sanatorium, Oakhurst, and the follow-up work is carried on by the visiting nurse.

In Tacoma the work is ably conducted at the Mountain View Sanatorium under Dr. Steele. Drs. Quevli and Dr. Penney are caring for tuberculous cases and have done considerable work in public health matters and education in antituberculosis measures.

In Everett Dr. Woodford has done considerable work along these lines both from educational as well as clinical standpoint. Considerable work in chest surgery has been done successfully here.

In Seattle the work has been divided into several divisions, each of which has functioned quite well. First, the King County Antituberculosis League, under Mrs. Klingberg and Miss Hughes, has arranged numerous lectures and talks to organizations, such as parents-teachers, school teachers, child welfare associations, as well as talks and clinics at high schools. They have maintained a summer camp, "Happy Acres," for run-down children which has been most beneficial. Second, the school clinic has cooperated and brought many children to examinations in the clinic. Third, King County maintains tuberculosis pavilions at the County Hospital, where are cared for mostly the more advanced type of patient, there being during the past year 65 entries, with capacity at present of about 100 patients under treatment. There are five visiting county nurses who follow up the tuberculous cases. Fourth, the Health Department of Seattle maintains the Firland Sanatorium and the Seattle tuberculosis clinic, and in addiiton has numerous visiting nurses who do the follow-up and sociologic work. Under Dr. Stith the clinic handled 1,561 cases, of which 993 were new cases, 360 of which were positive tuberculous patients. There were 250 deaths from tuberculosis in Seattle the past year.

At Firland there are 200 beds, of which 50 are for children. Here much has been done in chest surgery during the past year.

The visiting nurses of the clinic have seen 1,883 patients at home, making 6,198 calls.

The Laurel Beach Sanatorium, a private institution under Drs. Slyfield and Nelson, has admitted 145 patients, with 142 discharged, the cases here being private patients. Here the general care of tuberculosis as well as surgical treatment is given.

At the Riverton Sanatorium, an endowed private semieleemosynary institution under a staff management, there were admitted 150 patients, with 130 discharged. The usual sanatorium care of patients is given here in addition to surgical treatment. During the past year the sanatorium has received some fifty thousand dollars. Additional endowment bequests will be of much benefit in carrying on the tuberculosis work. The active staff of this sanatorium is composed of Drs. Robert Stith, W. S. Griswold, Philipp Schonwald and Charles R. Castlen, chief of staff.

In submitting this brief report, the committee has attempted to mention the various phases of this extensive work and give due credit to all. The great work is being done by the many practitioners of the state, not only in the vast amount of time spent in prevention and education of the public regarding tuberculosis, but also in the actual care and treatment of such unfortunates.

On motion the report was accepted.

### Resolutions

The Secretary-Treasurer offered the resolution endorsing the plan to celebrate the two hundredth anniversary of the birth of George Washington; also resolution adopted by the Minnesota State Medical Association in regard to the Medical Reserve Corps of the United States Army.

Dr. A. H. Peacock presented a number of resolutions relating to the care of injured workmen, and the welfare of the association.

Dr. H. J. Davidson was granted the privilege of the floor and spoke in regard to contract practice and proposed regulation thereof.

After considerable discussion motion was made and adopted that the above resolutions be submitted to a committee report at the next session of the House of Delegates. The Chairman appointed the following committee: Dr. A. H. Peacock, Chairman; Drs. John O'Shea, O. R. Austin, E. Weldon Young, and D. A. Nicholson.

The House of Delegates then adjourned until the following morning.

### Board of Trustees Meeting

The Board of Trustees then convened to hear the appeal of Dr. G. F. Hilton vs. Chelan County Medical Society. Dr. Hilton of Wenatchee complained Chelan County Medical Society would not accept his application for membership and acted in irregular manner in regard thereto. The president and secretary of the Chelan County Medical Society stated that they had given Dr. Hilton a fair hearing and his application had been rejected at a regular meeting. After considerable discussion, the Board of Trustees came to the conclusion they were only empowered to pass upon the procedure of the county society in rejecting this application and could not go into the facts of the case. Motion was made and adopted that Chelan County Medical Society submit a certified copy of their minutes relating to the rejection of this application, that Dr. Hilton file his statement, and that this matter be passed upon by the Executive Committee of the Asssociation. The Board of Trustees then adjourned.

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### Second Session

September 3

The second session of the House of Delegates was convened Wednesday morning at 9:00 a.m. On calling the roll, a quorum was found present. The following delegates answered to their names.

F. H. Brush, H. E. Cleveland, A. E. Anderson, J. R. Morrison, C. H. Thomson, J. H. O'Shea, S. L. Caldbick, D. C. Hall, D. H. Houston, C. L. Smith, P. J. Gallagher, George Anderson, Elmer Hill, H. E. Rhodehamel, J. T. Rooks, Frederick Epplen, A. E. Gerhardt, D. E. McGillivray, John Christensen, H. G. Miller, O. R. Austin, Roger Anderson, C. E. Hagyard, C. W. Shannon, H. E. Coe, J. T. Dawson, Oscar Proctor, A. H. Peacock, W. C. Speidel, E. W. Young, D. A. Nicholson, H. D. Dudley, H. L. Petit, F. A. Bird, F. W. Anderson, H. G. Willard, W. B. Penney, W. D. Read, S. W. Holton, C. L. Hoeffler, E. C. Leach, A. A. Matthews, R. N. Hamblen, S. S. Oppenheimer, S. E. Lambert, C. J. Johannesson, W. A. Hulbrush, W. A. Taylor, J. E. Bittner.

Motion was made and adopted that the Board of Trustees and the House of Delegates go into executive session.

### Report on Resolutions

The resolutions committee submitted the following report: (Motion was made and adopted that the report be acted upon by sections).

We, your Committee on Resolutions, make leave to submit the following report of such resolutions as have been submitted to this Committee to date.

I. Referring to the resolution requesting endorsement of the anniversary (two hundredth) of the birth of George Washington, we recommend its adoption.

WHEREAS, The Congress of the United States has created a Commission to arrange a fitting nation-wide observance of the Two Hundredth Anniversary of the Birth of George Washington in 1932, and

WHEREAS, The Commission so created, composed of the President of the United States, the Vice President of the United States, the Speaker of the House of Representatives, four members of the United States Senate, four members of the House of Representatives, and eight citizens appointd by the President of the United States, is charged with the duty of planning and directing the celebration, and

WHEREAS, The high purpose of the event is to commemorate the life, character and achievements of the most illustrious citizen of our Republic and to give every man, woman and child living under the Stars and Stripes an opportunity to take part in the celebration which will be outstanding in the world's history, and

WHEREAS, The George Washington Bicentennial Commission, desiring the full cooperation of the people of the United States, has extended a most cordial and urgent invitation to our organization to participate in the celebration, therefore be it

RESOLVED, That the Washington State Medical Association does hereby endorse the program of observance of the Two Hundredth Anniversary of the Birth of George Washington, to take place in 1932; accept with appreciation, the invitation of the George Washington Bicentennial Commission, and pledge this organization to extend earnest cooperation to the United States Commission in all possible ways, so that future generations of American citizens may be inspired to live according to the example and precepts of Washington's exalted life and character, and thus perpetuate the American Republic, and be it further

RESOLVED, That this resolution be incorporated in the official proceeding of this meeting and that a copy thereof be transmitted to the George Washington Bicentennial commission, Washington, D. C.

This resolution was adopted.

II. Referring to the request for an endorsement of a resolution, adopted by the Minnesota State Medical Association, recommending the endorsement of their action in reference to the status of certain officers of the Reserve Corps of the United States Army, we recommend the adoption of the same.

WHEREAS, The present Army regulations require that every reserve officer shall, during each five years commission period, put in two hundred (200) hours military work in camp, correspondence school, in active training meetings, or similar military activity, or else become ineligible for renewal of his commission with assignment to an Organized Reserve Unit, and, therefore, revert to the "Auxiliary Reserve" in time of peace, and

WHEREAS, There are many highly trained, highly skilled and very active physicians who, as reserve officers, have been assigned as chiefs and assistant chiefs of surgical, medical, laboratory, roentgen and other distinctly professional services in Organized Reserve Hospital Units, carrying very little administrative responsibility, and whose professional duties in busy private lives make them especially well fitted for their duties in their army assignments, but whose same duties make it practically impossible for them to carry on military work in time of peace, and

WHEREAS, Many of these men and their valuable attainments are being lost to the Organized Reserve, although they are willing and anxious to serve in time of need and do not aspire to advancement in grade, therefore, be it

RESOLVED, That the Washington State Medical Association, desiring that the medical profession may be of the greatest service to our country, respectfully suggest that the service might be enhanced if the regulations were changed to provide for recommission and reassignment of chiefs and assistant chiefs of professional services of Hospital Units, even though they have not completed the required amount of military work, and further, be it

RESOLVED, That a copy of this resolution be sent to the Surgeon and the Commanding General of the Ninth Corps Area, the Surgeon General, the officer in charge of Reserve Affairs, the Adjutant General and the Chief of Staff of the United States Army.

This resolution was adopted.

III. Referring to the resolutions presented by Dr. Alexander Peacock, we recommend the adoption of the following:

1. That the State Department of Labor and Industries, having charge of the Workmen's Compensation Act, in addition to the medical adviser, should employ associate medical advisers in different parts of the state in order to expedite the examination of applicants for indemnity and by so doing relieve the claimants of unnecessary expense of travel, in the matter of appeals.

This resolution was rejected.

2. That the Washington State Medical Association views with disapproval the solicitation of patients or group of patients and feels that the individuals should have the right to select his own physician or surgeon.

This resolution was adopted.

3. We recommend an amendment to the Insurance Code, placing all health insurance contracts and policies under the supervision and control of the State Insurance Commission. This to include every health insurance policy and agreement, regardless of whether it is fraternal, private or group agreement insofar as they pertain to the medical and surgical care of all individuals not covered by the State Industrial Insurance Act.

This resolution was adopted.

4. In the matter of a Grievance Committee, we recommend that, in view of the fact that the subject is too large to be decided hastily, it be referred to the Board of Trustees of this association and the Executive Committee of the Public Health League, with instructions to consider this question in all its angles, secure such legal advice as may be deemed necessary, and report their findings and recommendations to the House of Delegates at the 1931 session of the Washington State Medical Association.

This resolution was adopted.

5. In the matter of an amalgamation of the membership, joint occupancy of office space and joint clerical service of the Washington State Medical Association and the Public Health League of Washington, we recommend that this question be referred to the Board of Trustees of the Washington State Medical Association and the Executive Committee of the Public Health League for report and recommendation at its next session.

This resolution was adopted.

Motion made and adopted that the Board of Trustees of this Association meet at least once each quarter and that the Executive Committee of the Public Health League should meet at least once with the Board of Trustees.

The committee on Resolutions further reported that they had carefully considered the resolutions of Dr. H. J. Davidson. The parts of his resolutions which in our judgment pertain to the welfare of the State Medical Association have already been considered and acted upon in the resolutions presented by Dr. A. H. Peacock. The balance of his resolutions we recommend not approved.

This recommendation was adopted.

The committee recommended that the following Resolution be passed:

RESOLVED, That the Washington State Medical Association, in annual session, present a Memorial to the next session of the legislative bodies of the State of Washington as follows:

WHEREAS, Dr. Mitchell Langworthy, of Spokane, during the performance of his duties to the State of Washington was assassinated by a disgruntled applicant for indemnity to the Department of Labor and Inrustries, therefore, be it

RESOLVED, that his daughter be granted a pension of fifty dollars per month by the State of Washington until she reaches the age of twenty-one years; and that the necessary legislation be enacted so as to provide for this appropriation.

This resolution was adopted.

Dr. Roger Anderson then offered as a new resolution the following: Resolution endorsing in principle the proposed changes in the Industrial Act Bill, particularly in reference to,

a. Increase of compensation and revised methods of figuring rates.

b. Give the workmen better right of appeal.

c. Repealing Sec. 7724 (in part) of the Compensation Act which provides for industrial contracts; and permitting the workmen to select his own physician.

After considerable discussion, the foregoing was adopted by ballot.

### Deceased Members

The Secretary-Treasurer read the following list of deceased members:

Burns, Arthur E. Seattle, 1866-1929; Bellevue, 1886.

Langworthy, Mitchell, Spokane, 1892-1929; Univ. of Iowa, 1916.

Ransom, David H., Spokane, 1876-1929; Univ. of Buffalo, 1900.

Russell, Chas. H., Pullman, 1862-1929; Coll. of Phy. & Sur., 1888.

D'Arc, Harry T., Mount Vernon, 1880-1929; Univ. of Toronto, 1908.

Saunders, Harry A., Wenatchee, 1865-1929; Univ. of Nebraska, 1894.

Woodin, Scott P., Seattle, 1862-1929; Univ. of Mich., 1894.

Wimberly, Geo. W., Toppenish, 1875-1929; Geo. Wash. Univ. School, 1902.

DeBeck, David, Seattle, 1855-1929; Med. Coll. of Ohio, 1881.

Anthony, X. L., Spokane, 1870-1930; McGill, 1905.

McClanahan, Albert L., Mount Vernon, 1872-1930; St. Louis Univ., 1904.

Mattice, Menzo B., Sedro-Woolley, 1855-1930; Albany Med. Coll., 1881.

Baumgarten, Roy C., Seattle, 1889-1930; Jefferson Med. College, 1912.

Gray, George A., Spokane, 1869-1930; Univ. of Minn., 1898.

Bennett, Lewis F., Spokane, 1860-1930; Rush, 1886.

Gaines, Wm. S., Spokane, 1851-1930; Bellevue, 1887.

Mapes, John A., Seattle, 1872-1930; Univ. of Michigan, 1897.

Buckley, Daniel, Seattle, 1906-1930; Wash. Univ. School of Med., 1929.

Chamberlain, Geo. E., Aberdeen, 1864-1930; Univ. of Illinois, 1893.

McCulloch, George B., Seattle, 1859-1930; Bellevue, 1885.

Teel, Chas. S., Bellingham, 1861-1930; Kentucky School of Med., 1901.

Johnson, Hiram M., Toppenish, 1873-1930; Med. Coll. of Indiana, 1903.

Provost, Benjamin W., Wenatchee, 1888-1930; Loyola, 1916.

Wilson, G. Burwell, Pullman, 1861-1930; Cooper Med. Coll., 1892.

Elmore, Bruce, Seattle, 1876-1930; Columbia, 1903.

West, Wm. F., Sr., Everett, 1871-1930; Chicago Homeopathic Coll. 1902.

Hall, Willis H., Seattle, 1871-1930; Coll. of Phy. & Sur., 1898.

Greiner, Herman A., Seattle, 1878-1930; Gen. Med. Coll., Chicago, 1904.

Kloeber, John S., Yakima, 1865-1930; Univ. of Maryland, 1888.

Weyer, Ross W., Orting, 1877-1930; Univ. of Illinois, 1906.

Penn, Geo. T., Ritzville, 1864-1930; Northwestern, 1890.

MacLeod, Alexander F., Spokane, 1848-1930; Univ. of Michigan, 1878.

The President appointed the following committee to draw up suitable resolutions for the deceased members: Dr. H. D. Dudley, chairman, Dr. C. E. Hagyard, and Dr. E. Weldon Young. The committee was instructed to file these resolutions with the Secretary-Treasurer.

Motion made and adopted that By-Laws be brought up to date and printed and that each county and all delegates be furnished with a copy.

Dr. O. R. Austin then invited the Association to hold its next annual meeting in Aberdeen, Washington. On motion the invitation was accepted.

### Election of Officers

The following officers were then elected for the ensuing year: (Those whose terms did not expire are added to complete the list).

President, Dr. A. E. Anderson, Aberdeen. Term expires 1931.

First Vice-President, Dr. J. T. Rooks, Walla Walla. Term expires 1931.

Second Vice-President, Dr. H. L. Petit, Chehalis. Term expires 1931.

Secretary-Treasurer, Dr. C. H. Thomson, Seattle. Term expires 1931.

Assistant Secretary-Treasurer, Dr. J. H. O'Shea, Spokane. Term expires 1931.

#### TRUSTEES

*First District*

Dr. D. H. Houston, Seattle. Term expires 1931.
Dr. D. G. Dickerson, Seattle. Term expires 1931.
Dr. S. L. Caldbick, Everett. Term expires 1932.
Dr. H. J. Whitacre, Tacoma. Term expires 1932.

*Second District*

Dr. George Anderson, Spokane. Term expires 1931.
Dr. Elmer Hill, Walla Walla. Term expires 1931.
Dr. Carroll Smith, Spokane. Term expires 1932.
Dr. P. J. Gallagher, Spokane. Term expires 1932.

*Journal*

Dr. C. J. Johannesson, Walla Walla. Term expires 1931.
Dr. H. C. Olmsted, Seattle. Term expires 1931.
Dr. C. E. Hagyard, Seattle. Term expires 1931.

*Delegates to A. M. A.*

Dr. J. H. O'Shea, Spokane. Term expires 1931.
Dr. Chas. Mowery (Alt.), Spokane. Term expires 1931.
Dr. Frederick Epplen, Seattle. Term expires 1932.
Dr. W. B. Penney (Alt.), Tacoma. Term expires 1932.

The House of Delegates and Board of Trustees adjourned sine die.

## SCIENTIFIC PROGRAM

Tuesday, September 2

10:00 a.m. "The Treatment of Acute Diffuse Septic Meningitis by the Intramuscular Injection of Autocerebrospinal Fluid." Dr. J. T. Rooks, Walla Walla.

Preliminary report discussed by Dr. Edward S. Lanzer, Rock Springs, Wyo.

"An Experience with Evaporated Milk in Infant Feeding." Dr. Harry C. Olmsted, Seattle.

"Surgical Diseases of the Spleen." Dr. Dean Lewis, Johns Hopkins University.

12:00. Public Health League Luncheon.

1:30 p.m. "Vomiting in Pregnancy." Dr. E. J. Barnett, Spokane.

"Separation of the Upper Femoral Epiphysis." Dr. C. F. Eikenbary and Dr. John Le Cocq, Seattle.

"Traumatic Injuries of the Brain." Dr. G. W. Swift, Seattle.

"Hypertension." Dr. J. M. Blackford, Seattle.
"Harelip." Dr. H. E. Coe, Seattle.
6:30 p.m. Informal Banquet.
"A History of Surgical Anesthesia." Dr. C. D. Leake, San Francisco.

Wednesday, September 3

10:00 a.m. "Malignancy of the Large Bowel." Dr. Fred W. Rankin, Mayo Clinic.
"Intravenous Pyelography by Uroselection." Dr. O. A. Nelson, Seattle.
"Medical Economics." Dr. H. J. Whitacre, Tacoma.
1:30 p.m. "Observation on Gallbladder Surgery." Dr. C. W. Sharples, Seattle.
"Seventy-five Successive Biliary Surgical Cases." Dr. J. C. Lyman, Walla Walla.
"Further Studies in the Relationship of Gallbladder and Liver Infections." Dr. J. R. Else and Dr. Millard Rosenblatt, Portland.
"Recent Advances in Preanesthetic Medication." Dr. C. D. Leake, San Francisco.
"Tumors of the Spinal Cord." Dr. D. G. Dickerson, Seattle.
"Polyglandular Disease with Predominating Thyroid Symptoms." Dr. R. H. Loe, Seattle.

### SPOKANE COUNTY MEDICAL SOCIETY

Pres., C. B. Ware; Secty., R. P. DeRiemer

The regular meeting of Spokane County Medical Society was held at Spokane Country Club September 11. About one hundred members and their families were present at a dinner, followed by the program arranged by Dr. Carroll Smith. A piano solo was rendered by Mrs. Lorenzo Walter following the dinner.

Drs. J. C. Bunten, Clarence L. Lyon, J. W. Lynch and Alfred O. Adams were unanimously elected to membership in the society. Dr. Harold T. Anderson of Coeur d'Alene, Ida., was elected to associate membership.

Dr. Whitacre of Tacoma presented a paper on "Medical Economics," well illustrated by a series of charts with tabulations.

Attorney Don Kizer of Spokane followed Dr. Whitacre and used much of his material to joke with the medical profession. His talk kept the audience highly amused.

The next meeting will be arranged by Dr. J. G. Cunningham, as announced by President Ward.

## OREGON

### LANE COUNTY MEDICAL SOCIETY

Pres., I. R. Fox; Secty., H. G. Talbot

Lane County Medical Society held its first regular meeting of the year at Eugene September 12. About thirty-five members were present with visiting members from Corvallis.

Dr. Charles E. Hunt of Eugene read a paper, "Training the Child to Eat."

Mr. Jack Magladry of Eugene read a paper, "The State Industrial Accident Commission and Its Problems."

Drs. E. L. Zimmermann and William Kuykendall of Eugene gave a report of the activities of the Medical-Dental Health Bureau of the Lane County Society and the Southern Willamette District Dental Society.

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# BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Collected Papers of the Mayo Clinic and Mayo Foundation. Vol. XXI, 1929, Published May, 1930. W. B. Saunders Co., Philadelphia and London.

The Mayo Clinic volume has become one of the most important medical publications of each year. In this number there are 181 articles printed in full, abridged or abstracted; and references to 290 others. In the earlier volumes the matter was chiefly clinical, but since the beginning of the Mayo Foundation the number of purely scientific papers has been increasing, but it has been thought advisable to restrict those printed in these pages to matter that will prove of some practical service to the general practitioner, internist and surgeon.

Rivers and Hartman write on the statistics of cases, in which the preoperative diagnosis was either cholecystitis or cholelithiasis. In 502 cases with a preoperative diagnosis of cholelithiasis it was found at operation that, in 28.9 per cent of the cases with gallstones, chronic appendicitis also occurred. In 12.7 per cent of cases with gallstones there was hepatitis, and in 7.8 per cent pancreatitis was also a complication. Chronic and subacute cholecystitis were present in nearly 30 per cent of cases of gallstones; and in 15.2 per cent cholecystitis only was found without stones. In 879 cases, in which the preoperative diagnosis was either cholecystitis or cholelithiasis, there were found as additional complications chronic appendicitis in about 30 per cent of cases, hepatitis in 14 per cent, and pancreatitis in 7.4 per cent. So that besides occasional miscellaneous diseases, as rarely cancer and cholangititis, the important complications are chronic appendicitis in about one-third of gallbladder troubles, and pancreatitis in nearly one-twelfth of these cases.

Kirklin, in his review of cholecystography in over 24,000 patients examined within the past four years, makes some valuable comments. To irregularities of contour the writer attaches little importance, as denoting disease of the gallbladder or adhesions, since the gallbladder shadow has often a perfectly symmetrical contour, when the organ is buried in adhesions, and when the shadow is very irregular in outline the gallbladder may be found perfectly normal at operation. Mottling must be distinguished from gas, calcified lymph nodes and costal cartilages, and the reviewer would add calcified areas in the gallbladder itself which he observed in one case where stones were diagnosed by roentgen-ray films. The most important and practical observation of Kirklin is that in nearly 20 per cent of cases with normal cholecystograms the gallbladder is found diseased at operation. This is borne out by the work of Caylor and Bollman who have shown in advanced disease of the gallbladder that concentration of bile may be preserved or even enhanced and it is upon this function alone that cholecystography depends. The deduction naturally follows that diagnosis of gallbladder trouble cannot be made by the roentgenologist, when the roentgenograms are normal. The absence of shadow (or very faint shadow, so as to be barely visible in all films) is the only valuable and almost positive sign of cholecystitis.

A very valuable paper is that by Louis B. Wilson on improved training of medical specialists. He finds that, in addition to four years clinical hospital work, it is essential that during six months of this time the student should pursue some sort of investigative work that will require him to delve into some field of anatomy, physiology, physiologic chemistry or pathology, for it is through thorough grounding in these fundamental studies that excellence in diagnosis depends. The technic of intensive investigative work will stand specialists in good stead all the rest of their professional careers. It has been possible to only touch upon a few of the great number of valuable subjects in this volume from the greatest clinic the world has ever seen or is likely to see for some time.

WINSLOW.

A PRACTICAL MEDICAL DICTIONARY. By Thomas Lathrop Stedman, A.M., M.D., Editor of the Twentieth Century Practice of Medicine, etc. Eleventh Revised Edition. Illustrated. 1222 pp. $7.50. William Wood and Company, New York, 1930.

The new edition of this authoritative dictionary, which appears every two years, is thoroughly revised, presenting new titles necessitated by advances in medical knowledge. Particularly in bactriology has the changed nomenclature been especially noted. New definitions in the physics of radiology have been extensively adopted. The author notes certain purifications in medical orthography. The letter *k* is changed to *c* in words derived from the Greek through the Latin, as illustrated in leucorrhea. The retention of the terminal *e* in alkaloids, such as morphine, is in accordance with the most approved chemical terminology. It is noticeable that the hyphenization of many compound words has been abolished, such as gastroenterostomy, gallbladder and similar words in daily use. At the same time is retained the suffix ending in *al* which is commonly omitted in such words as anatomic and physiologic. Another leading medical dictionary maintains the opposite forms of spelling in most of the details mentioned above. It would promote stability in medical orthography if the same rules were followed by all such publications.

A medical dictionary is essential for every physician, whose studies and writings require authoritative reference concerning spelling, definitions and manifold forms of information. This work by Stedman is unsurpassed. One will not be disappointed if he has this book within hand's reach for daily use.

ARTERIAL HYPERTENSION. By Edward J. Stieglitz, M.S., M.D., Assistant Clinical Professor of Medicine, Rush Medical College, University of Chicago, etc. With 21 Illustrations. 280 pp. $5.50. Paul B. Hoeber, Inc., New York, 1930.

Medical literature is enriched by this valuable and critical monograph which represents the annual lectures at Rush Medical College. Separate chapters on the anatomy, physiology, pathogenesis, etiology, symptoms, treatment and prognosis of hypertension are followed by two additional chapters on the factors of cardiac and renal reserve and finally one on arterial hypertension in pregnancy.

Of special interest are his views concerning the pathogenesis of hypertension. The progressive tendency of the disease is explained by the vicious cycle, resulting from the essential or fundamental cause of hypertension, increased peripheral resistance due to arteriolar muscular hypertonia which in time results in vascular muscular fatigue and this, whatever the initial cause of the hypertonia may be, by reducing the threshold of stimulation, leads to exaggerated response to lower degrees of stimulation and thus to still more vascular hypertonia. The initiating factors of this hypertonia are characteristically multiple, and in the individual case these several factors—infections, intoxications, endocrine disturbances, heredity, etc.—have to be searched for and removed where possible.

Besides evaluating the usual therapeutic procedures the author attacks the problem of hypertension by breaking up the vicious cycle not only by attempting to eradicate the initiating etiologic factors, but also by eliminating the perpetuating factor of vascular fatigue. This is attacked by the administration of bismuth subnitrate orally for long periods of time, which results in continuous enteral absorption of small amounts of powerful vasodilating nitrites which are demonstrable in the urine. Five years use of this chemical is convincing of its potent therapeutic value.

A. L. JACOBSONS

ULTRAVIOLET RAYS IN THE TREATMENT AND CURE OF DISEASE. By Percy Hall, M.R.C.S. (Eng.), L.R.C.P. (Lond.), Hon. Actino-Therapist, the Mount Vernon Hospital, London and Northwood, etc. With introduction by Sir Henry Gauvain, M.A., M.D., M.C. (Camb.), F.R.C.S., Medical Superintendent, Lord Mayor Treloar Crippples' Hospitals, and Leonard E. Hill, M.B. (Lond.), F.R.S., Director, Department of Applied Physiology and Nation Institute of Medical Research, London. Fourth Edition. 248 pp. $4.50. The C. V. Mosby Company, St. Louis, 1930.

Much has been written during recent years concerning the employment of ultraviolet rays in treatment of disease. To most minds the subject is hazy and obscure. Some profess skepticism as to any benefit derived from this method of treatment. If one will read this book, he will find a clear discussion of the physics, physiology, pathology and hygiene of light which clearly explains the role which it plays in the existence of life and relief from disease The respective spheres of infrarer and ultraviolet rays are clearly and convincingly presented. It is emphasized that ultraviolet rays, far from being harmless, may prove detrimental unless used skilfully and with understanding. Chapters are devoted to the employment of actinotherapy in a great variety of diseases, ranging from those of skin, neurasthenia and nervous conditions to stomach disorders, rheumatic, tuberculous, asthmatic and metabolic disorders. If one is seeking real information from an authoritative source, he will not be disappointed in reading this volume. It is one of the most conservative and satisfying works on this subject which has been published. It can be commended as of real value.

GALVANISM AND SINE CURRENT TECHNIC. By Frederick H. Morse, M.D., Ex-President of the American Electro-Therapeutic Association, etc. 254 pp. $6.50. The Tudor Press, Inc., Boston, 1930.

The author of this volume is one of the best known physical therapists. As an instructor and practitioner in this special line of work his name is familiar to everyone who follows this line of practice. While lower voltage currents are employed by every physical therapist, their manifold applications are neglected by many. The author devotes comparatively little space to the explanation of the

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basic principles or theories of galvanism and since currents, this volume being devoted chiefly to their practical uses. Methods of applying galvanism in the treatment of specific diseases are outlined with sufficient illustrations to emphasize the text. The chapter on electrodiagnosis clearly and concisely presents the method of its application. The treatment of different diseases by the galvanic current is described, the technic of each being properly illustrated. The author has written many articles concerning intestinal stasis. The relief of this condition by sinusoidal currents is described at some length. Colonic irrrigation and electricity in gynecology receive due consideration. One might criticize the brevity of some explanations, where more detail might be useful, but the author's purpose is clearly to employ brevity in description. This is a helpful book for this phase of physical therapy.

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Diseases of the Skin. A Text-book for Practitioners and Students. By George Clinton Andrews, A.B., M.D., Associate Professor of Dermatology, College of Physicians and Surgeons, Columbia University; Consulting Dermatologist and Syphilologist to Tarrytown Hospital; to St. John's Hospital, Yonkers; to Grassland's Hospital; and to the Broad Street Hospital, New York City. 1901 pages with 988 illustrations. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $12.00 net.

This book is probably the most complete edition of any of the various isssues of dermatology in the English literature. The chapters on roentgen-ray, radium and ultraviolet therapy, from the standpoint of dermatology, are probably the most complete to be found in any general text in dermatology. Practically every condition is well illustrated, with from one to four illustrations of every phase of any particular condition. The edition includes the complete biography of all important literature up to the time of this edition. The one frank criticism is that the book tends to follow the more or less stereotyped procedure, as classifying dermatology purely on a pathologic rather than an etiologic basis.

Parker.

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An Introduction to the Study of Physic (Now for the first time published). By William Heberden (1710-1801). A Prefatory Essay by LeRoy Crummer, with a Reprint of Heberden's Some Account of the Disorders of the Breast. Portrait in Photogravure. Six Illustrations. 159 pp. $2.00. Paul B. Hoeber, Inc., New York, 1929.

Anyone interested in medical bibliography will find much of profit in this volume. Heberden was one of the distinguished medical men of his century, being contemporary of the Hunters and Harvey. He was physician to Sir Samuel Johnson, Cowper and other literati, and an intimate of Benjamin Franklin. His medical publications were among the famous texts of the day. One of the best known was "Some Account of a Disorder of the Breast," published in 1768, describing the well known angina pectoris which term he introduced in this essay.

An Introduction of the Study of Physics was recently discovered by Crummer in an old book store, which he purchased for a small sum, its value as a work of antiquity in the script of the author not having been recognized. It is published in full in this volume, being thus for the first time presented to the public. It consists of short chapters on botany, chemistry, materia medica, anatomy, surgery and a few other topics. The text displays the versatility of this distinguished author and offers interesting comments on various phases of medical practice. He states that in the study of both chemistry and botany the young physician is taught how to get enough to warn him not to get too much. In the study of anatomy the student is cautioned he will have few opportunities of improving in anatomy after he has begun practice but must live on the stock of his early studies. He includes an interesting chapter on ancient Greek and Latin medical writers, some of which seem to have been utilized in his day.

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Dietetics and Nutrition. By Maude A. Perry, B. S., Formerly Director of Dietetics at the Michael Reese Hospital, etc. 332 pp. $2.50. The C. V. Mosby Company, St. Louis, 1930.

The aim of this book is to present scientific and technical material in plain and simple language to meet the needs of schools, training schools for nurses, graduate nurses, physicians and teachers. Beginning with a chapter on food and the normal diet, there follow discussions on nitrogenous and nonnitrogenous foods, outlining the values and necessities for each. A chapter on vitamins discusses them from A to E, outlining the function, source and suitabilities of each. Separate chapters are devoted to the dietaries of specific disease, with suggested test meals for different conditions that may arise. A chapter on ketogenic diet therapy offers interesting suggestions for overcoming ketosis in certain conditions. Anyone might find it profitable to read this volume.

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Outline in Obstetrics for Nurses. By F. W. Rice, M. D., Instructor in Obstetrics, Iowa Methodist Hospital, Des Moines, Iowa. Illustrated. 228 pp. $2.00. The C. V. Mosby Company, St. Louis, 1930.

The author states this is intended as a quick reference book, enabling one to get a bird's-eye view of symptoms and treatment. The various features of delivery are briefly outlined with numerous illustrations illustrating the teachings. A nurse can herein obtain much information presented clearly and concisely.

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Results of Tonsillectomy. Considering all the data from a ten year follow-up study of tonsillectomized children, Albert D. Kaiser, Rochester, N. Y. (*Journal A. M. A.*, Sept. 20, 1930), concludes that: The real value of the removal of tonsils and adenoids cannot be definitely established in a few years. Apparent benefits during the first few postoperative years are not so evident over a ten year period. Outstanding benefits are apparent in influencing the incidence of sore throats over a ten year period. Substantial benefits are apparent in rendering children less susceptible to scarlet fever and diphtheria. Acute head colds and otitis media, though definitely lessened over a three year period, are not essentially influenced over a ten year follow-up period. Cervical adenitis is decidedly reduced in tonsillectomized children over a ten year period. The respiratory infections, such as laryngitis, bronchitis and pneumonia, not only are not benefited but actually occur more frequently in tonsillectomized children. First attacks of rheumatic manifestations occur from 30 to 50 per cent less often in tonsillectomized children. The greatest reduction occurs in children tonsillectomized early. Recurrent attacks are not benefited at all. Incomplete tonsillectomies do not offer the same protection against the usual throat complaints and infections as complete removal of tonsils. The hazards of tonsillectomy must be considered in evaluating the end-results. Considering this hazard, the late results seen in 2,200 children ten years after operation are evident only in the reduction of sore throat, cervical adenitis, otitis media, scarlet fever, diphtheria and rheumatic fever and heart disease.

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## ADDRESS

## COOPERATION IN THE MEDICAL PROFESSION*

Wilson Johnston, M.D.
PORTLAND, ORE.

Through your graciousness in electing me your president, it becomes my pleasing duty to welcome you to the fifty-sixth annual meeting of Oregon State Medical Society. We are glad to have you share our Portland hospitality. We hope your stay may be most pleasant, that good fellowship may prevail and that the keen interest which always dominates our scientific meeting will not be lacking.

A little over a year ago we welcomed to this city our great national medical organization, the American Medical Association. Those of you who attended that meeting know that words of mine cannot adequately describe how splendidly, efficiently and generously the needs of the Association, its members and guests were taken care of. That meeting was a credit to the profession of Oregon and something which they may long regard with pride and satisfaction. We know that such a meeting did not just happen but was the result of careful planning and much work on the part of all members, especially those serving on the different divisions of the committee of arrangements. As president, I wish to express publicly to Dr. E. A. Sommer, chairman of the committee of arrangements, and to all the members of his committee, the hearty appreciation of the Society for their most excellent work.

This year we have reached the membership goal set by the fifty-second annual meeting of this Society in 1926, when the need of a full time executive secretary was stressed and the prediction made that with a permanent five year program we could increase our membership to seven hundred. This year our membership reached seven hundred and sixteen with fourteen deaths, leaving a net membership of seven hundred and two.

With about fifteen thousand persons directly associated with the practice of medicine and its branches, it would seem that we have a group with tremendous potential possibilities for professional and public good if properly organized. The coordination of all organizations interested in the prevention of disease should be an important function of the state Society and the Oregon Public Health League. A Council or Advisory Board, consisting of the presidents and secretaries of these different organizations, should meet once or twice a year to discuss the various phases of their work and to see that there is no overlapping of programs, no chance of friction and that all the work planned has the approval of the medical members of the Board.

At the last annual meeting of the House of Delegates, the Committee on Public Policy recommended that steps be taken to secure the passage of a basic science law by initiative at the general election in 1930. When your officers started to carry out this recommendation, they found the profession was not a unit as to the best type of basic science law or the best method of securing the passage of such a law. This year has, therefore, been devoted to presenting this subject to the district and county societies. I have visited all district societies except two, and hope that some progress toward a better understanding of the basic law has been made. It is proposed that this subject be kept before the county societies for the next two years.

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* President's Address, read before the Fifty-sixth Annual Meeting of Oregon State Medical Society, Portland, Ore., Sept. 17-19, 1930.

In all the societies visited there has been open dissatisfaction with the present policy of the Industrial Accident Commission in granting an increasing number of contracts to hospital associations. This question was asked me more than once, "How is it that hospital associations and groups can send a layman into my town and solicit business and the doctors of those organizations still be considered ethical while, if I solicit business from house to house, I am considered unethical and dropped from the Society." These questions should be answered by this Society in no uncertain manner. It is time either to hold to the traditions and ethics of the profession or to put them in discard. The status of industrial practice is the most disturbing factor in the profession at the present time and it challenges the best minds of our members. In speaking of industrial practice, I want to recognize two distinct types; one, where large corporations employ physicians to take care of their employes on salary and where assistants, hospitals and consultants are paid adequate fees; the other, a parasitic type that plays the physicians and hospitals against one another so as to reduce fees to the minimum and from whom the collection of an emergency fee is like pulling the proverbial hen's tooth. This latter is the disturbing type and is altogether objectionable to the medical profession and the spirit of medicine.

One of the hopeful marks of progress has been the establishment of two central county units this year, one at Eugene for Lane county and the other at Salem for Polk and Marion counties. This spirit of cooperation in the profession has great possibilities and may eventually lead to the solution of this vexing and perplexing industrial practice problem.

In conclusion, I wish again to express my thanks for the honor of serving as your president and to thank all of those who by word or deed have contributed to the success of my administration and to assure the Society of my most hearty goodwill and best endeavor in the future.

## ORIGINAL CONTRIBUTIONS

## MALIGNANCY OF THE LARGE BOWEL *

Fred W. Rankin, M.D.
ROCHESTER, MINN.

That marked progress has been made in the general treatment of carcinoma is, I believe, a reasonable assumption, and not tinged with too much optimism. That this success pertains especially to diagnosis, treatment and prognosis of malignant lesions of the colon is an unescapable conclusion, if one studies a long series of cases. That this progress in dealing with carcinoma of the large bowel and rectum (for they must be considered so closely allied as to be inseparable in treatment) has been forwarded by improved methods of diagnosis, particularly roentgen-ray diagnosis, as well as by preoperative care for rehabilitation, and careful selection of technical maneuvers, is self-evident.

Knowledge of the physiology of the large bowel is steadily increasing, and yet much remains to be done in this field before relief can be afforded from many ailments, particularly those of low-grade inflammation now amenable in some measure to medical treatment. The absorption of the fluid from the right half of the bowel, and the use of its left segment as a storehouse, emphasize the difference in development of the two segments and are, perhaps, the greatest factors in determining the type of growth as well as the chain of symptoms produced by neoplasms. All but about 10 per cent of the absorption of fluid in the gastrointestinal tract takes place in the right half of the colon. Consequently, this is the active physiologic portion of the large bowel and symptoms arising from it represent a disturbance in the physiologic equilibrium, whereas the bowel on the opposite side, harboring a different pathologic type of growth and being host to a hardened, formed type of intestinal content, naturally reflects its symptoms in obstructive phenomena.

To set down accurately, in sequence, a chain of symptoms caused by carcinoma of the large bowel is impossible, particularly if one desires to emphasize merely the earlier manifestations of the disease. The obvious reason for this is that the symptoms vary in different segments of the bowel according to the situation of the lesion, its pathologic type and the presence or absence of complications, such

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* Division of Surgery, The Mayo Clinic, Rochester, Minn.

* Read before the Forty-first Annual Meeting of Washington State Medical Association, Mount Baker Park, Wash., Sept. 2-3, 1930.

as metastasis, perforation or ulceration. Unquestionably, the greatest advance in the diagnosis of diseases of the large bowel in the last decade has been at the hands of the roentgenologists, and today, with adequate preparation and cooperation on the part of the patient, the roentgenologist may, by fluoroscopic examination and by supplementary evidence on roentgenograms, report the presence of lesions which will be proved at operation in the same satisfactory and accurate percentage as in diseases of the upper part of the gastrointestinal tract. An accurate roentgenologic diagnosis of 95 to 97 per cent of gastric or duodenal lesions is no longer looked on as unique. To approach this high degree of perfection in the diagnosis of colonic lesions beyond the view of the proctoscope, namely, the middle of the sigmoid flexure, is not only within the realms of possibility but an accomplished fact. Weber, in 1929, in the Section on Roentgenology of The Mayo Clinic, made a correct diagnosis in ninety-nine of one hundred and two organic lesions of the large bowel, beyond the middle of the sigmoid flexure, as was proved by subsequent exploration.

Carcinoma always causes more or less pronounced interference in the integrity of the lumen of the colon. If there is distention of the lumen with opaque material, this can be visualized and the deformity is known as a filling defect. Rarely a nonmalignant affection of the large bowel will exhibit this phenomenon as well, but when it is due to carcinoma it has pathognomonic features which make the diagnosis accurate, and its persistence of occurrence and typical characteristics make the radiologic method the only objective preoperative diagnostic evidence at our disposal. Radiologically controlled, and aided by palpatory manipulation, the opaque enema is the method preferred for accurate localization of the filling defect in the large bowel. I emphasize the opaque enema in contradistinction to the oral meal, because of the tendency in some quarters to continue this obsolete and unsatisfactory method which, aside from its lack of accuracy, is in the case of an obstructing growth a positive menace, since not infrequently it produces acute intestinal obstruction superimposed on a chronic process.

Under the fluoroscope, definite canalization of the lumen of the bowel may be visualized and the rough, jagged contours of its margins, associated with the firm, knotty consistence of the mass, which is frequently felt in association, are the cardinal differential characteristics. Occasionally, in the sigmoid colon, because of its inaccessibility deep in the bony pelvis and its frequent fixation there by any process affecting it or by complicated anomalous multiplication of its coils, the difficulty of inspection makes the diagnosis relatively uncertain. That this is a rare occurrence, however, is borne out by the clinical experience; it is now universally recognized that the most significant factor of error is the failure on the part of the roentgenologist to obtain adequate exposure of the involved lumen of the bowel. With this valuable addition to our diagnostic armamentarium, an accurate anamnesis and a careful general examination should permit a diagnosis of organic colonic disease in most cases, or should at least give sufficient evidence of a lesion to urge a complete roentgenoscopic examination at the hands of a competent roentgenologist. With improvement in roentgenologic technic and as familiarity with symptoms of organic disease of the colon increases, I am convinced that more routine general examinations will call for more routine colonic examinations, particularly roentgenographic and proctoscopic, with the result that a higher percentage of latent lesions will be discovered at a time when they are more susceptible to measures of extirpation.

The sequence of events which occurs in cases of carcinoma of the colon, differing as it does according to situation and pathologic change, is fairly conclusive, if one divides the colon sharply into two segments, the right half, which corresponds to that portion proximal to the middle of the transverse colon and which develops with the midgut, and the left half, which is distal to the middle of the transverse colon and is developed with the rectum from the hindgut. In the right half of the large bowel, the large, flat, ulcerating growths, frequently covered with stubby protuberances like granulation tissue, occur on the lateral wall of the colon and present a large, ulcerating surface for absorption but do not tend to produce obstruction because of: (1) the liquid nature of the fecal current at this point; (2) lack of a tendency to encircle the bowel, the lumen of which is greater here than elsewhere in its course; and (3) the likelihood that the growth will go on to penetration, perforation or the formation of abscess.

In most cases, symptoms of carcinoma in the right side of the colon may be classified under three main headings: (1) so-called dyspepsia, mild in character, with few localizing symptoms, and usually diagnosed chronic appendicitis; (2) loss of weight, loss of strength, weakness and profound anemia; and (3) a mass or tumor accidentally discovered in the right iliac fossa which on further investigation will prove to be a neoplasm.

The first group represents a high percentage of latent, unsuspected cases of carcinoma of the right half of the colon which may be interpreted early, if routine roentgenologic examinations are urged. It should be emphasized here that in most cases of carcinoma of the colon in the earliest stages, very few pathognomonic symptoms are manifest, but usually a warning is given by change of bowel habit or bowel irregularity, such as mucous diarrhea, or alternating periods of diarrhea and constipation. Should the suggestive symptoms of irregularity of the bowel appear early without explainable cause over a period of a week to a month, a routine examination certainly would prevent many of the sad disasters to patients who present themselves in the late stages of the disease with complications and distant metastasis. Pain or local tenderness over the cecal area, simulating appendicitis and without a tendency to disappear entirely, should call attention to the necessity of examination of the gastrointestinal tract because these are among the early symptoms.

In the second group, namely, that characterized by anemia, weakness and loss of weight, one element is outstanding in the symptoms relative to the right half of the colon, profound anemia with concomitant decrease in the entire blood picture, yet without visible loss of blood. Attention may be called to such anemia by the patient's inability to carry on his work or by unexplained weakness, or it may be found on routine examination without apparent cause. An exact explanation of this type of anemia cannot be given, but it is probably due to some perverted function of the mucous membrane which impairs it to such an extent that absorption of toxins from the broad, infected surface of the growth occurs, as the work of Whipple and Smith, Koons and others, has demonstrated. It is customary in textbooks on the subject to demand distinction between carcinoma of the stomach and pernicious anemia, but I think that more often one is called on to distinguish between pernicious anemia and carcinoma of the right half of the colon. True, the blood picture of pernicious anemia does not resemble the secondary anemia of either extensive carcinoma of the large bowel or stomach, but the distinction between primary and secondary anemia is so important that it must always be made, and in the production of secondary anemia, organic lesions of the right half of the colon certainly stand among the most prominent causes.

The syndrome of neoplastic growths of the left half of the colon is evidenced more by symptoms of obstruction of an acute, subacute or chronic nature than by physiologic disturbances. The type of growth which tends to encircle the lumen of the bowel, the hard, formed fecal content of the left half of the colon, and its anatomic make-up, all predispose to obstruction, so to speak. Borborygmus and visible peristaltic movements, associated with increased flatulence, may be accounted for by change in the intestinal content, or it may be due to degeneration of the tumor or to obstructive changes which accompany stenosis. Visualization of peristalsis is possible only in lean subjects or in those in whom contraction of the lumen of the bowel produces such obstruction as to bring about proximal dilatation with increased stenosis. Tumefaction in the left half of the colon is more common than in the right half, possibly because of the greater accessibility of the left half of the colon, but probably because of the obstructive nature which dams back the content of the bowel and produces dilatation. The progressive constipation of elderly persons, which occurs in from about 25 to 40 per cent of the cases, should, as a rule, call attention to mechanical stenosis before routine examination is made.

The definition of constipation by any individual patient is difficult to interpret. Many patients, when questioned about the number of stools passed each day, do not inform the examiner accurately, for frequently they are inclined to consider the bowel movements normal when they have gone to stool four to six times and, in fact, pay little attention to early irregularity, whether it is manifested by constipation or diarrhea. Chronic diarrhea in the case of an elderly patient may often be due to malignancy.

Blood in the stool is a symptom which is usually emphasized in any consideration of carcinoma of the large bowel. It is my belief that the blood must be bright red, or that continual tests for positive occult blood must be made before significance can be attached to its presence. Blood in the stool may come from any portion of the alimentary tract. When it is secondary to carcinoma, it frequently is due to trauma caused by the growth, as at the angles of the colon and in the left half of the colon. Bright red blood in or on the stool is pathognomonic of rectal lesions. If tests for occult blood give positive results, the lesion may be anywhere between the buccal cavity and the rectum, and, in my experience, this has been of more significance in the diagnosis of unusual tumors of the small bowel than of lesions of the colon and rectum.

I would emphasize a little more in detail the obstructive phenomena which occur in cases of carcinoma of the colon, usually of the left half. Obstruction may be of three varieties, acute, subacute and chronic, and in any event it represents a serious, and unless relieved a lethal, complication. In about 5 per cent of all cases of malignancy of the large bowel, acute obstruction occurs without premonitory symptoms, "out of a clear sky." It may be due to volvulus, intussusception, plugging of the lumen of the bowel or to swelling of an inflammatory process, superimposed on the malignant lesion. The chronic or subacute varieties, however, are much more frequently met with and, in conjunction with tumefaction or borborygmus, blood in the stool, or other well-known signs of carcinoma of the left half of the colon make the diagnosis relatively certain.

Burgess, in a review of a large series of cases of intestinal obstruction in a hospital in Manchester, England, noted that a third of all cases of acute obstruction resulted from acute stenosis of the colon, and he pointed out that, if one could exclude hernia and intussusception, after localizing the lesion to the colon, the chances were nine to one that malignancy would be the cause. Chronic intestinal obstruction is probably present in most cases of carcinoma of the large bowel at one time or another and its tendency is progressive. Usually the premonitory symptoms of irritability of the bowel or change in bowel habit, which are the earliest symptoms of a malignant lesion of the colon, are caused in the left half of the colon by the beginning stenosis secondary to the growth.

Tenesmus as a symptom of carcinoma of the colon is not significant, except when the growth is close to the rectum. When the growth is at the rectosigmoid juncture, and as it approaches the rectal sphincter, tenesmus increases and straining at stool is more marked. It is an untrustworthy symptom of disease of the colon and is rarely found except in the presence of low-lying growths.

In summarizing the diagnostic evidences of carcinoma in any of the segments of the large bowel, it may be said that the most significant early symptoms are: (1) change in bowel habit, as evidenced by increased irritability of the bowel, some form of diarrhea, usually designated as mucous diarrhea, or alternating periods of constipation and diarrhea; (2) localized pain or tenderness without a tendency to disappear; (3) tumefaction; (4) profound anemia, usually not associated with loss of blood; and (5) obstruction of the acute, subacute or chronic variety. Confronted with any of these suggestive phenomena, a patient should immediately be urged to undergo, at the hands of a competent roentgenologist, a complete examination of the intestinal tract in the belief that the presence or absence of an organic lesion may be positively demonstrated. In this connection, I would strongly urge that such symptoms as loss of weight, cachexia, dehydration and desiccation, commonly set down in textbooks as symptoms of carcinoma of the large bowel, are in reality symptoms of metastasis and approaching lethal state, and that the responsibility of waiting for the development of such a chain of evidence to establish a diagnosis of malignancy falls on the examining physician, and is not to be treated lightly.

### SURGICAL PROCEDURES

Surgical removal of carcinoma of the colon unquestionably precedes all other measures from the standpoint of curability. If the lesions cannot be removed in a radical manner, that is by extirpation of the local growth and lymph nodes in immediate juxtaposition, frequently side-tracking operations or palliative measures may be employed. I shall not consider the use of radium or roentgen rays in the treatment of carcinoma of the colon because I am not familiar with the technical details of administration, and my limited experience has left me little optimism as to their curative value. In fairness to these reagents, it must be admitted that the inaccessibility of the growth and lack of direct application are largely responsible for unsuccessful end-results in many cases in which they are used.

Surgical extirpation, as applied to carcinoma of the colon, is again governed by the site of the growth, and measures adapted for removal of carcinoma of the right half are not applicable to growths in the left half. The fundamental principle of individualization of the patient with growths in the rectum or colon, from which deviation has been rare in The Mayo Clinic during the last three years, the stressing of standardized preoperative measures, and the careful selection of technical maneuvers have aided materially in improving end-results. Preoperative rehabilitation aims at: (1) increasing the patients' resistance, for most of them are poor risks and are rarely able to stand a formidable surgical procedure; (2) improving the local condition by reducing infection around it; and (3) adequately individualizing each case, selecting the optimal time for exploration and the most advantageous type of procedure, either in a graded or in a single maneuver. Such preoperative rehabilitation measures as blood transfusions, increase in the amount of intake of fluid, adequate and proper dietary measures and occasionally drainage procedures, have proved exceptionally beneficial. The local infection around the growth and the amount of obstruction present are attacked at the same time by decompression measures, such as repeated enemas, judicious purgation and occasionally, in cases of more advanced obstruction, the employment of cecostomy or enterostomy as a preliminary step to subsequent resection.

Introduction of intraperitoneal vaccine of streptococci and colon bacilli has proved so satisfactory that it is done as a routine in the clinic. Theoretically, it is a correct procedure and experience in nearly five hundred cases has convinced us that it has a direct bearing on mortality from peritonitis, which is the greatest single lethal factor.

The choice of an anesthetic is important, both from the standpoint of the patient and the surgeon. It has been my custom in the last three years to employ spinal anesthesia in all operations on the colon and rectum as a routine, unless it is decidedly contraindicated. I make the single exception in perineal extirpation of the rectum, which is done following colostomy under caudal, or sacral and caudal, anesthesia. I accept the probable increase in risk with spinal anesthesia over the inhalation method, but I do this with full knowledge that if the patient survives the operation, the chances of subsequent contamination are minimized because the abdomen is splinted and kept quiet over a period of thirty-six to forty-eight hours. Thus far untoward results have not occurred following the use of spinal anesthesia and I feel confident that its employment may be continued into the future. The ease of operating, the satisfactory exposure and the bloodlessness of the field, all militate to more satisfactory technical procedures, while the postoperative quiescence of the gastrointestinal tract is a most desirable feature against subsequent peritonitis.

The choice of operation differs in the two halves of the colon and may not be considered in detail here. I believe, however, that a good working rule for growths in the right half is the employment of a single procedure only in the very best class of risks; in the average or poor risks, a grade maneuver is indicated. It is my belief that the operation of choice for removal of growths in the right side of the colon is aseptic anastomosis between the terminal portion of the ileum and the transverse colon, dividing the bowel and implanting it end-to-side. I emphasize the necessity of making an end-to-side anastomosis because of the fact that any graded maneuver has as its primary object the desire to remove the infection in and around the growth. This is impossible if the fecal stream is not diverted, and lateral anastomosis fails to do this most incompletely.

If, after making the anastomosis, one decides that the patient's condition and the local condition warrant extirpation of the right half of the colon at this stage, it is a perfectly feasible operation and may often be successfully accomplished. I believe that in about half of the cases of carcinoma of the right half of the colon, a single stage maneuver may be accomplished at the primary operation. In the cases which constitute poor risks, after rehabilitation measures have been carried out, ileoclostomy and resection may best be accomplished in two stages. If a single-stage operation is attempted, it is often advantageous either to do an ileostomy distal to the anastomosis, or to bring the cut end of the bowel, which is turned in with catgut sutures up into the skin, through the peritoneum, so it may be grasped with forceps on the fourth or fifth day, after the C. H. Mayo method, if intracolonic distention develops from pressure of gas. Drainage following extirpation of the right half of the colon is, of course, an individual problem which must be decided as such.

If the growth is situated beyond the hepatic flexure or, more accurately, beyond the middle of the transverse colon and down to the juncture of the middle and lower thirds of the sigmoid, I prefer to remove the offending segment of bowel at one stage by an obstructive type of resection in every case in which chronic or subacute obstruction may be reduced to a minimum. I have found this type of procedure, which utilizes all of the satisfactory fundamental principles of the Mikulicz operation and avoids all of its disadvantages, the most satisfactory for removal of all mobile segments of the bowel. By mobilizing the bowel accurately, ligating the blood supply close to the root of the mesentery, and extirpating all of the glands and gland-bearing tissue in the immediate vicinity of the growth, just as radical a resection may be carried out as is possible by any type of surgical procedure. Making sure of the blood supply to the two ends of the bowel, and leaving a clamp on after the bowel is removed and the toilet of the peritoneum is completed, leaves the colon completely obstructed for a period of forty-eight to sixty hours. At the end of this time the proximal clamp is released and gas pressure blows the end of the colon open. The subsequent steps of the operation are completed exactly as in the old Mikulicz operation. It is the rule that most of these wounds heal spontaneously at the end of about two months, if enough spur has been removed from between the two gun barrels and pouting mucous membrane has not been left outside of the wound. The Mikulicz operation, as originally described, is now used in only a few cases, but the operation in its present form takes care of the majority of cases of carcinoma in mobile segments in the colon.

Occasionally it is essential to do colostomy for decompression, with resection and anastomosis at a second stage. This procedure is the second choice but is applicable to many cases and may be used satisfactorily when indicated.

One particular point should be emphasized in relation to the operation for carcinoma of the colon, and that is the importance of the time element only insomuch as sufficient time is allowed to elapse between stages. To hurry to the second stage without waiting a considerable time following the initial step is not only a mistake but frequently results in disaster. I have found that the longer I wait between stages the more likely is the outcome to be favorable.

### MORTALITY

The admittedly high mortality rate following surgical removal of portions of the large bowel for carcinoma seems to be compensated for by the satisfactory end-results. For since we have been accustomed to look on the mortality rate as necessarily huge, following operation for carcinoma of the rectum and colon, many surgeons have lost their optimism for attacking such growths by extensive maneuvers. Unquestionably, a mortality rate of 10 or 12 per cent, or even higher, is discouraging when compared with the immediate surgical mortality in carcinoma of the breast, lip, body of the uterus and so forth, but if a comparison is made of the immediate mortality in carcinoma of the large bowel and in carcinoma of the stomach, I believe the results will be favorable. There are no simple surgical procedures with which to "dilute" the mortality following operations for carcinoma of the large bowel. If one compares the final results in resections of the bowel to resections of the stomach, the discrepancy in mortality will be slight.

During the last year, at The Mayo Clinic, 527 patients were submitted to operation for organic disease of the large bowel, largely carcinoma. Of this group, 380 patients had carcinoma of the large bowel and rectum for which 238 resections were performed. Sixty-five of the patients died, a mortality rate of 12.3 per cent. However, in this group, 755 operations were performed, making the mortality rate, by operation, 8.6 per cent. The operability of 57.5 per cent is high, but unquestionably could be improved by earlier diagnosis which would permit a larger number of patients to seek relief at an earlier stage, before metastasis or local fixation rules out the possibility of surgical treatment of a curative nature.

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# REHABILITATION IN SURGERY OF THE COLON*

S. F. Herrmann, M.D., Ph.D.,
TACOMA, WASH.

There have been various periods in the development of surgery. Ancient surgery was followed by anatomic, antiseptic and aseptic periods, each bringing advances based on the extension of scientific knowledge in a particular field. We are at present in what might be called the rehabilitation period. In this modern period actual surgical intervention is merely one incident in the management of a patient. All forces, medical and surgical, are combined in investigating and attempting to correct every pathologic factor before and after the operation. There are diseases that are immediate surgical emergencies, such as hemorrhage, acute intestinal obstruction, acute perforation, acute appendicitis, but the greatest advance in recent times has been made in those conditions, in which, although necessarily surgical, there is time to be more deliberate, and to first rehabilitate the patient. Not a little of the improvement has come through greater application of physico-chemical knowledge. An outline of the proper steps in the management of surgical lesions of the colon will illustrate what is meant by such rehabilitation.

The number of surgical lesions of the colon is relatively small. Cancer, benign tumor, hyperplastic tuberculosis, chronic ulcer, stricture, diverticulitis practically complete the list. Perhaps chronic ulcerative colitis should also be mentioned, although it is not often by choice or necessity a surgical disorder. In most of these lesions, except the last named, there is one common pathologic factor which causes the alteration in physiology, and which must be corrected, namely, obstruction.

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When one considers all the many ailments ascribed to constipation, it is surprising to note how little apparent disturbance in physiology results from actual chronic intestinal obstruction. The obstruction which results from a growing carcinoma of the colon develops gradually. In the absence of metastasis and malignant cachexia obstruction may become relatively complete before anorexia, starvation and dehydration cause ill health. Until such time there may be little loss of weight and strength. Demonstrable changes in blood chemistry also appear very late. In the presence of a large, sloughing, infected, ulcerating lesion, such as one sees in the right half of the colon, notably the cecum, a high degree of secondary anemia will also develop.

There is apparently no abnormal absorption from an obstructed colon unless, in addition to the obstructive pressure, there is also a break in the surface of the mucosa. This was shown by the experiments performed by Higgins and myself.[1] We produced colonic obstruction in dogs by means of tape ligatures and then fed them colloidal graphite (hydrokollag). There was no demonstrable absorption of graphite particles unless ulceration developed in the obstructed, distended colon; but under these conditions the graphite entered the intestinal capillaries and could be abundantly demonstrated in the liver. From this combination, then, of obstruction plus ulceration one may expect toxemic symptoms. Incidentally this same combination may be the reason for earlier metastases to the liver from lesions of the left colon, where obstruction more readily becomes complete and the distending pressure, therefore, will be relatively great.

These factors, obstruction, starvation, dehyrdation, anemia and possibly toxemia, are the basis of the rehabilitation problem in the case of a patient with a colonic lesion who is to be prepared for surgery. To operate on the distended abdomen of an enfeebled, emaciated, dehydrated patient means almost certain death. The wall of the dilated colon, packed full of fecal material, may be reduced to a mere membrane almost as thin as tissue-paper, and any surgical manipulation is liable to cause fatal soiling of the peritoneal cavity. Much can be done by proper preoperative preparation.

Unless the obstruction is absolute, which is seldom the case, there need be no hurry about surgical intervention. Preliminary preparation in the hospital is very essential. The fluid balance is restored by plentiful administration of liquids by mouth if tolerated, or usually by hypodermoclysis or intravenous infusion. Enemas two or three times daily, together with catharsis, gradually effect an emptying of the distended colon. A nonresidue carbohydrate diet supplies energy, and does not refill the bowel with fecal mass. This diet will consist largely of fruit juices, candy, jello, broth, butter, cream and custard. One can readily give 3000 calories of such food, and it is even possible for a debilitated patient to gain weight on this diet. Severe anemia may require transfusion. The patient is ready when the colon is relatively empty, the tissue turgor improved, and the glycogen reserve somewhat restored. On the day before operation intestinal motility is lessened by repeated doses of paregoric.

This preparatory regime diminishes the operative risk not only because of the generally improved condition of the patient, but because after such preparation the technical procedures of surgical intervention can be carried out with less danger of gross fecal soiling. But another factor of safety can be established by intraperitoneal vaccination. This has been shown to raise the local tissue immunity of the peritoneum.[2] Such local immunity is quickly established, and is a much greater defense than general immunity induced by subcutaneous vaccination.

Probably the most important pathogenic components of the fecal flora are streptococci and colon bacilli. This was shown by animal experiment. Any irritant injected intraperitoneally will, by arousing vascular and leucocytic forces, confer some degree of nonspecific immunity to fecal soiling, but the injection which proves most effective is a vaccine of streptococci and colon bacilli. Two injections of one cubic centimeter are given intraperitoneally with an interval of three days. Three days after the second dose the patient is ready for surgery. By following this scheme Rankin and Bargen[3] were able to report a lowering of mortality from 23 to 5 per cent. Of course the importance of the other phases of preoperative preparation, as previously outlined, must not be underestimated.

I shall not discuss the various types of operation. The surgeon will lessen the danger of postoperative peritonitis by accomplishing the desired resection in at least two stages. To precede the actual resection by a preliminary colostomy or an ileocolostomy not only simplifies the technical problem, and improves the condition of the patient, but also causes a peritoneal reaction which confers relative immunity to subsequent peritoneal soiling. The choice of any procedure is a matter of individual experience and judgment. An experienced operator may perform a resection in one stage in selected cases. The avoidance of fecal soiling of the peritoneum is one desideratum, but of equal if not greater importance is the preservation of adequate blood supply to the line of anastomosis. The peritoneum can be immunized against a moderate degree of contamination, but no amount of immunization will protect against constant leakage from a gangrenous suture-line.

Of greatest importance in the postoperative care is strict interdiction of anything taken by mouth for at least four days. Hypodermoclysis of two liters of salt solution daily will take care of fluid requirements. To prevent parotitis, arising from undue dryness of the mouth, chewing gum, slices of lemon and frequent rinsing are of service.

## SUMMARY

Resection of the colon is seldom an emergency. The actual surgical operation is only one incident in the rehabilitation of the patient. Cooperative, careful, purposeful preparation and aftercare are most essential to success.

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# INTESTINAL OBSTRUCTION *

## RECENT CONTRIBUTIONS TO ITS STUDY

G. E. BURGET, PH.D.

PORTLAND, ORE.

In order to throw further light on the treatment of intestinal obstruction as seen clinically, many investigations have been carried on in experimental laboratories. Attempts have been made to simulate the condition in animals and to study them carefully for enlightenment upon the symptoms and treatment. The following are some of the problems that have been repeatedly studied: What is the toxic substance in the fluid above the obstruction? Is it specific? B. welchii is present; is it the principal offender? What relation does distention of the bowel bear to toxin absorption? Why do blood chlorides fall? When does nonprotein nitrogen of the blood rise and why? These are by no means all the questions that might be asked, but I shall confine my discussion largely to them.

Much of the experimental work has been devoted to studying animals, in which the condition of obstruction was thought to be simulated by making a closed loop of small intestine, dropping it back into the peritoneal cavity and reuniting the intestine by an end-to-end anastomosis. Loops of small intestine made thus in dogs have almost invariably resulted in death in two to five days. The loop distends and ruptures into the peritoneal cavity, causing death from peritonitis and absorption of toxins from the loop material. The higher the loop, the more rapid is distention, rupture and death. Clinical observations have shown that there is invariably distention of the gut above obstruction or of the segment involved in strangulation. For this reason the contents of experimental closed loops which rapidly become distended have been searched for a special toxic substance as the cause of death.

Van Zwallenburg[1] some years ago put forth the idea that distention in any infected hollow viscus is a material factor in bringing about strangulation and necrosis. In order to investigate this theory we made closed loops of the small intestine and reunited the intestinal tract by an end-to-end anastomosis[2]. Instead of leaving the loop free in the abdominal cavity, it was brought to the anterior abdominal wall and its antimesenteric border lightly attached to the peritoneum. The point of attachment was marked by a stitch in the skin. By inserting a hollow needle through the skin and into the loop, the pressure developed in it could be measured and the fluid withdrawn when desired. The average maximum pressure recorded during the few days immediately following the operation was found to be 40 cm. water (30 mm. Hg.). This intraloop pressure, together with distention of the loop and stretching of the capillaries, tends to embarrass the circulation to the extent of producing necrosis and consequent rupture of the loop. However, if the fluid is aspirated and the intraloop pressure prevented, the animal does not show toxic symptoms, does not vomit, and makes an uneventful recovery.

There is no marked fall in the blood chlorides of these animals. There is no vomiting. Nonprotein nitrogen of the blood does not rise. The animal shows practically no toxicity. If the loop is allowed to become distended with fluid, the animal vomits,

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*University of Oregon Medical School.

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a reflex phenomenon at first, since he will eat at once following aspiration of the loop fluid. If the pressure is not relieved, vomiting continues; he soon becomes toxic, and dies in a few days. Autopsy shows a gangrenous ruptured loop with the abdomen filled with a gray blood-tinged fluid. After the circulation becomes impaired in the loop, toxin absorption begins to take place through the injured mucosa, kidney damage is brought about and the nonprotein nitrogen of the blood rises. These observations point to a direct relationship between the distention of an obstructed bowel and the appearance of toxic symptoms. Distention means increased intragut pressure. Increased pressure and stretching of the capillaries mean embarrassed circulation, and this leads to toxin absorption and necrosis. If drainage can be established before the bowel becomes gangrenous, a long step toward recovery has been taken.

One more word must be said upon this toxic substance in the fluid above obstruction. Our observations show that no matter how toxic, so long as distention is kept down and normal circulation to the segment of bowel maintained, toxins are not taken up or at least not faster than they can be handled by the liver. Wangensteen and Chunn[3] have shown that this material in the gut above obstruction is no more toxic than the content of a normal small intestine. Their preparations were made by diluting a small amount of toxic fluid or content of normal small intestine with physiologic salt solution, filtering twice and then putting through a Berkefeld filter. Plates were made to ascertain sterility; injections were made into a vein. Material from normal gut thus prepared and given proved as toxic as that from an obstructed segment. There would seem to be no particular or specific toxin here, then.

Toxins are present in quantity, but that is what would be expected, where there are numerous organisms and a medium for them to live on. There is no strange and elusive substance here, however, that, when taken up by the lymphatics or peritoneum, causes death. B. welchii or its spores are usually present in our closed loops but cause no disturbance so long as distention is prevented, nor are they the cause of distention and fluid formation. Therefore, the use of B. welchii antitoxin as has been suggested by some would not seem to be of great value in obstruction.

There is an obvious reason for a fall in blood chlorides in high obstruction; the individual vomits. This fall is not seen in our dogs, where there is very little vomiting. Repeated vomiting causes tremendous loss of gastric juice. This is itself a sufficient cause for grave symptoms. By making a pouch out of the entire stomach of the dog, bringing the pylorus to the abdominal surface as a fistula, and connecting the duodenum to the lower end of the esophagus, Dragstedt and Ellis[4] have brought out the importance of the loss of gastric secretion. In such an experiment the animal loses its entire gastric secretion which amounts to one to two liters per day. There is a marked fall in blood chlorides and death in five to eight days. If large quantities of salt solution are injected intravenously daily, the blood chlorides are kept up and life prolonged indefinitely. In clinical obstruction at the pylorus or in the upper small intestine a more or less complete loss of gastric juice is brought about by vomiting.

White and Fender[5] showed the importance of this loss in a different way. After producing a high obstruction in a dog, these investigators collected the vomitus and injected it into the intestine below the obstruction. The animal remained in good condition for a month. These experiments prove beyond any doubt the seriousness of the loss of gastric and duodenal secretions. They further show that the loss of chlorides in intestinal obstruction is not by the route of neutralization.

### CONCLUSIONS

An attempt has been made to emphasize the importance of some recent investigations bearing upon the problems of intestinal obstruction.

1. The pressure and distention brought about by accumulating fluid in an obstructed segment of bowel should be relived by drainage as soon as possible. Otherwise, the circulation soon becomes impaired, the mucosa permeable to toxins and eventually gangrene and rupture follow.

2. There is no specific toxin in obstructed gut fluid that is the cause of death. Material from an obstructed loop is hardly more toxic than material from a normal intestine. B. welchii antitoxin is probably not of much value.

3. Blood chlorides fall because of loss of gastric secretion and an attempt should be made to replace this loss by giving sodium chloride solution. There would seem to be no sufficient reason for assuming that the fall in chlorides is brought about by their utilization in toxin neutralization.

4. High obstruction is more rapidly fatal than low obstruction because of the great loss of fluids and minerals by vomiting in the case of high obstruction.

# GASTROCOLIC FISTULA

Arthur Betts, M.D., F.A.C.P.
SPOKANE, WASH.

Two unusual cases of gastrocolic fistula are presented, and the literature briefly reviewed.

Case 1. Gastrocolic fistula secondary to carcinoma of the stomach. Mr. V. P. A., aged 51, was referred by Dr. D. H. Lewis for roentgen-ray study. He had had indigestion at irregular intervals for two years. For three months there had been a constant dull epigastric pain which was more severe after eating. He complained of belching large quantities of foul smelling gas. He had vomited twice during the preceding week. The vomit was not fecal nor of the coffee-ground type. There was no history of tarry stools. There was a weight loss of fifteen pounds.

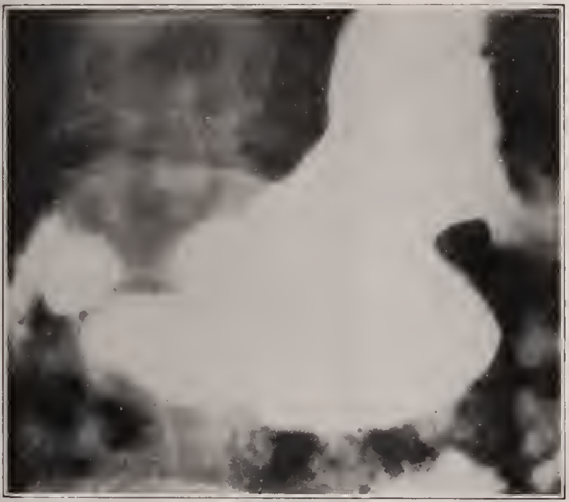

Fig. 1, Case 1. After barium meal. The fistula and a portion of the colon are outlined.

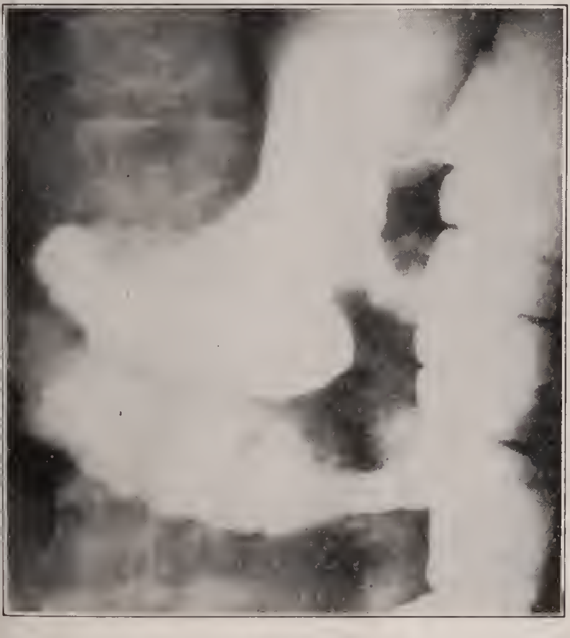

Fig. 2, Case 1. Film taken after barium enema. The transverse and descending colon are superimposed. The stomach was completely filled through the fistula.

Palpation of the abdomen revealed a large tumor in the epigastric and umbilical regions. There was no free hydrochloric acid and a total acidity of twelve in the stomach contents after the Ewald test meal. Tests for occult blood were positive. The red blood cell count was 4,112,000 and the hemoglobin 80.

Roentgen-ray findings: There was a large filling defect, extending along the greater curvature from the fundus to the middle of the body of the stomach. This defect corresponded with the palpable mass. Through the center of the mass was a large fistula connecting the stomach and transverse colon. The flow of the barium enema from the colon to the stomach was free but only a small amount of the barium meal emptied through the fistula. There was no gastric retention at the six hour period. The transverse colon was constricted at a point three inches proximal to the fistula (figs. 1 and 2).

Pathologic report: Carcinoma of the stomach with extension into transverse colon. Metastatic carcinoma of mesocolon, adjacent lymph nodes and liver. There was a fistulous communication 4 cm. in length and 1.5 cm. in greatest diameter, connecting the stomach and transverse colon through the carcinomatous mass.

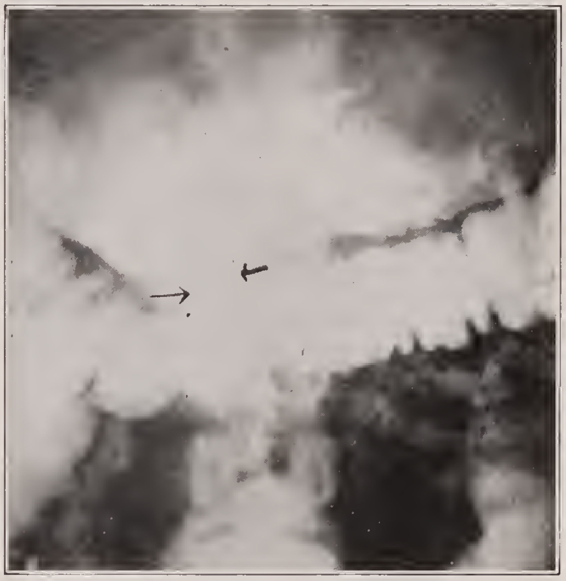

Fig. 3, Case 2. Film taken after barium enema. The stomach is partially filled. The fistula is marked by arrows.

Case 2. Double gastrojejunocolic fistula. Mr. F. W., aged 52, was referred for roentgen-ray study by Dr. J. T. Bird. His complaints were diarrhea and loss of weight. Six years before the onset of present trouble he had had a gastrojejunostomy for pyloric obstruction, with relief of all symptoms.

The diarrhea had been continual and progressive for five months. There were eight to ten bowel movements each day, at regular intervals of two to three hours. There was no relationship to meals. The stools were soft, light yellow and had never been bloody or black. There was no tenesmus nor griping. The weight loss was fifteen pounds. There was no history of foul eructations or vomiting. Abdominal examination revealed no palpable masses.

Analysis of gastric contents gave free hydrochloric acid 55 and total acidity 85. Tests for blood were negative. There was no blood nor undigested food in the stools.

Roentgen-ray findings: Pyloric obstruction and dilated stomach. The stomach emptied entirely through the gastrojejunostomy. There was a small pocket in the jejunum about two inches distal to the stoma. The colon was not visualized on fluoroscopic examination but on the films, taken a few minutes later, the outlines of the colon could be seen. On examination with the barium enema the fistula was demonstrated and barium could be seen flowing into the stomach from the transverse colon (fig. 3).

Dr. Bird recovered a methylene blue solution from the stomach a few minutes after it had been given as an enema.

At operation, Dr. F. A. Bryant found two fistulas, one connected the transverse colon and stomach at the gastroenterostomy stoma, the other connected the transverse colon and jejunum. The small bowel for twelve inches was constricted by scar tissue and adhesions.

## REVIEW OF THE LITERATURE

Czerny[1] in 1903 reported the first case of gastrocolic fistula following gastroenterostomy. The seventy cases previously reported originated from cancer of the stomach or colon. In 1912 Haudek[2] made the first roentgen-ray diagnosis of gastrocolic fistula caused by carcinoma of the stomach. Burnham[3] in 1917 reported the first carcinoma of the colon with fistula into the stomach, in which the diagnosis was made with the roentgen-ray.

Verbrugge[4] in 1924 studied all previously reported cases and wrote the most complete article on the subject. He collected 202 cases of gastrocolic fistula from the literature. Seven of these were from the Mayo Clinic and he added fourteen more, making a total of 216 cases. Since then the following cases have been added: Six by Dickson,[5] four by Brock,[6] two by Lahey and Jordan[7] and one case each by Kuttner,[8] Jansson,[9] Pratt,[10] Robertson,[11] and Golob.[12]

Verbrugge noted that fistulas due to carcinoma were decreasing and that those due to gastrojejunal ulcer were increasing with the growing popularity of gastroenterostomy. Nearly all reported cases have been in males and in the age periods when ulcers and cancers develop. Trauma, abdominal tuberculosis and gastric ulcer are uncommon causes.

Symptoms: The symptoms are masked by those of the primary condition. Diarrhea is the most constant symptom. It is usually persistent with ten to twelve bowel movements a day and does not respond to treatment. The stools are usually yellow, at times watery, and may contain undigested food. Lienteric diarrhea and fecal vomiting are considered by Dickson to be cardinal symptoms. In cases secondary to gastrojejunal ulcer, the stools have an acid reaction and contain neutral fats.

Weakness and loss of weight are common symptoms and may be extreme, if the diarrhea is of great intensity. Vomiting of fecal material in the absence of symptoms of intestinal obstruction is pathognomonic but it occurs in only a few of the cases. Eructation of foul gas is a frequent symptom. It is usually offensive to the patient but in some cases is noticed only by others.

Pain is inconstant and variable. It is most often caused by the primary condition but may be due to colic from inflammation or stricture of the colon. Physical signs are unimportant and may be absent. A palpable mass may be discovered in cases of carcinoma or when there are sufficient postoperative adhesions.

Diagnosis: Perisistent diarrhea, loss of weight, fecal vomiting without intestinal obstruction, and eructation of fecal smelling gases are suggestive symptoms. When they occur following a gastroenterostomy, a diagnosis of gastrojejunocolic fistula is easily made. Recovery of colored solutions from the stomach after colored enema or the use of colored meals which appear rapidly in the stools are diagnostic procedures.

Roentgen-ray examination is the most valuable method. The size and site of the fistula and in most cases the associated pathologic changes may be demonstrated.

Verbrugge noted in the Mayo Clinic cases that seven cases not diagnosed clinically were not diagnosed by roentgen-ray. Dickson, on the other hand, reported six cases diagnosed by roentgen-ray, in five of which the condition was not suspected after clinical examination. The diagnosis of all cases of gastrocolic fistula reported since 1924 has either been made or verified by roentgen-ray examination.

## SUMMARY

Two cases of gastrocolic fistula are reported. One is secondary to carcinoma of the stomach and the other is a case of double fistula following a gastrojejunostomy.

Gastrocolic fistula is an unusual condition and occurs most often as a sequel of gastroenterostomy.

Roentgen-ray study is the most reliable measure of establishing a diagnosis of gastrocolic fistula. In all cases reported since 1924, the roentgen-ray has given positive evidence of the condition.

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# DIAGNOSIS OF SPINAL CORD TUMOR*

DORRELL G. DICKERSON, M.D., F.A.C.S
SEATTLE, WASH.

Tumor of the spinal cord offers a favorable prognosis, if the diagnosis is made before cord damage or general complications occur. Generally speaking, a good prognosis may be given in over forty per cent of the cases. It, therefore, behooves those responsible from a diagnostic standpoint to accurately localize the lesion. At this time it is inexcusable to subject a patient to laminectomy and later have to perform a second operation on account of an inaccurate localization. Judging from some of the cases reported, the average patient suffering from a spinal cord tumor does not secure an accurate diagnosis for at least two years.

Phillips, as early as 1792, reported a case of spinal cord tumor, but it was not until 1887 that the first successful removal was accomplished by Gowers and Horsley. In the intervening forty-one years much has been added to our knowledge of this subject.

Tumors of the spinal cord occur more often during middle life. They may be found, however, at any age. Here is the story of a boy with pain in the back and in the right leg for eighteen months. His clinical history is as follows:

Case 1. R. S. Age 14 years. Seen in consultation with Dr. H. J. Wyckoff.

Early in 1929 he began to experience a dull pain in the back of his right leg. At first the pain was slight and lasted for short periods. There was some cramping of the muscles in the back of the thigh. All discomfort disappeared for a period of six months and then returned with renewed intensity. Since then the pain has been constant and is increased on sneezing, coughing and laughing. During the last two months bowel movements have been attended by severe pain, radiating into the back of the right thigh. On walking over rough pavements he notices increased pain. While lying quietly on his back there is very little discomfort with the exception of cramping on the inner side of the right thigh.

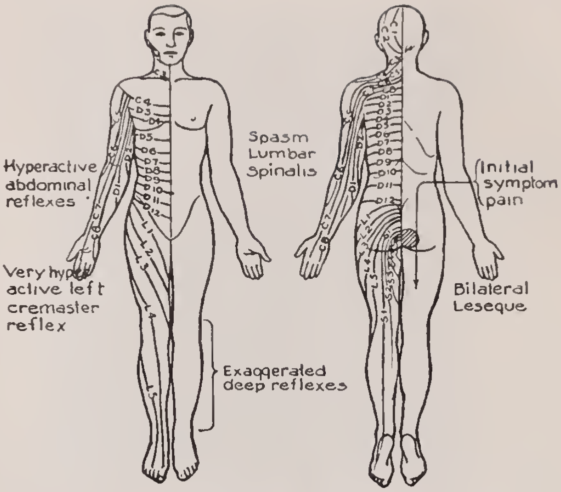

Fig. 1. Case 1. Extradural fibroma compressing roots of cauda equina.

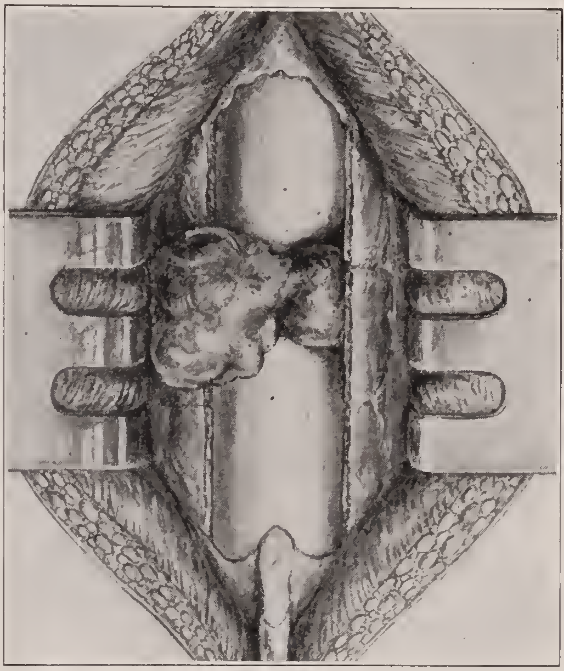

Fig. 2. Case 1. Extradural fibroma, arising anteriorly between fourth and fifth lumbar vertebrae.

Neurologic patellar reflexes are exaggerated, the left being 3 plus and the right 2 plus. Tendo achillis reflexes are 2 plus and the abdominals exaggerated, more on the left side. Left cremaster is extremely hyperactive. Lesague's test is strongly positive on both sides, more so on the left. There is muscle spasm over the lumbar muscles. Sensory examination shows an area the size of a silver dollar, asymmetrical in distribution over sacral segments three, four and five. In this zone there is hypalgesia and hypesthesia and delayed thermal sensibility. He is unable to feel the

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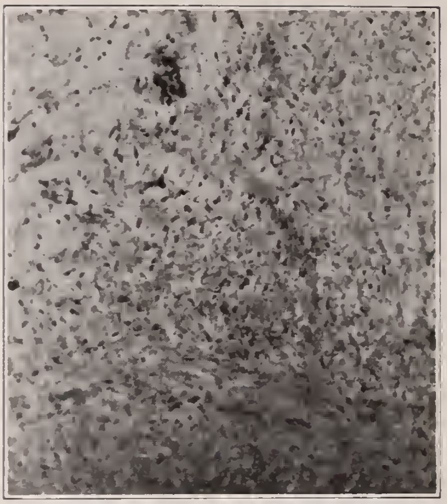

Fig. 3. Case 1. Photomicrograph of extradural fibroma.

vibrating tuning fork on the sacrum and vibratory sensibility is absent below the level of the fourth lumbar spine.

Lumbàr puncture demonstrated a positive Queckenstedt. The fluid was xanthochromic; normal cell count, with increased globulin.

Diagnosis: Tumor of the cauda equina was considered as a probability.

Operation: Exploratory laminectomy disclosed a firm, irregular, extradural fibrous tumor lying between the fourth and fifth lumbar vertebrae (figs. 1, 2, 3).

Most authorities state that trauma plays little, if any, part in the etiology. Considering the number of injuries to the back in proportion to the number of spinal cord tumors, it is only fair to assume that trauma plays little part in their production. Some writers have reported the onset of symptoms following pregnancy. This, as a true cause, is questionable. The probabilities are that in such cases the changes in the pelvis and spine incident to pregnancy aggravate or precipitate symptoms of a dormant growth.

A patient who gives a story of long continued pain in the back, abdomen or extremities, without adequate physical cause, may harbor a tumor of the spinal cord. It is not always an easy matter to differentiate the pain arising from disease of the abdominal viscera or pelvis, the atypical pain of sacroiliac disease, and that due to a tumor impinging upon the lower roots of the spinal cord, nor is it a simple matter to differentiate pain in the lower extremities, due to low-grade inflammatory vertebral disease and inflammatory lesions of the cauda equina. Intrathoracic lesions, either tumor or inflammation, may produce intercostal neuralgia. Likewise a tumor of the spinal cord may produce pain in many respects similar to that of an expanding thoracic lesion or inflammatory disease.

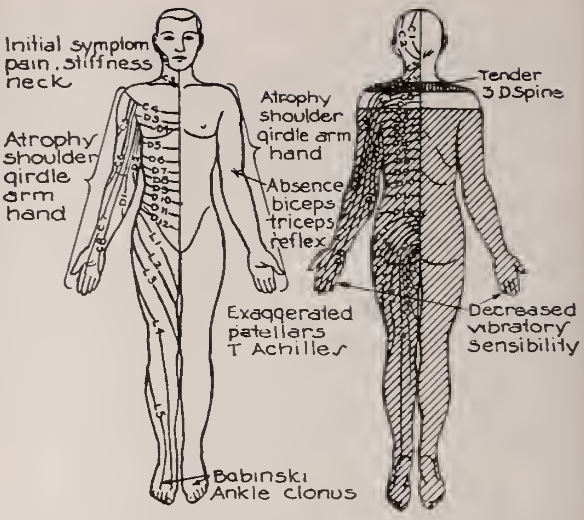

Fig. 4. Case 2. Intramedullary fibrolipoma, second thoracic segment.

While the vast majority of patients suffering from spinal cord tumor will, at some time during the course of their illness, complain of pain, there are cases where pain does not occur or if it is present, it may be so insignificant as to escape attention. As an example let us study the following history:

Case 2. B. B. A white male, 18 years of age, seen in consultation with Dr. Harry Friedman at Providence Hospital.

When eight years of age he began to have discomfort and stiffness of the neck, for which an Albee operation was performed on the supposition that the condition was tuberculous. Through a period of ten years it was observed that he was becoming progressively spastic in both legs and suffered a loss of power in the right arm. This was accompanied by the gradual development of numbness below the level of the shoulders.

He presented the following neurologic findings: Atrophy of the left shoulder girdle, arm and forearm, interossei and lumbricales. The left grip was decidedly weak. There was some weakness and atrophy of the right arm, hand and fingers, exaggerated patellar reflexes, absence of the left trcieps and biceps reflexes, bilateral Babinski and Gordon, and ankle-clonus. There was hypesthesia, hypalgesia and diminished thermal sensibility below the second dorsal segment and tenderness over the third dorsal spinous process. A band of hyperesthesia ran through the level of the sixth cervical segment and there was complete absence of vibratory sensibility below the hips and diminished vibratory sensibility in both arms. The abdominal reflexes were absent but the cremasters were present.

A lumbar puncture revealed clear fluid, a pressure of 12 mm. and the manometric tests were considered negative.

It was felt that we were dealing with a compressive lesion of the second dorsal segment, probably a spinal cord tumor.

Operation disclosed an intramedullary firbolipoma in the second dorsal segment (fig. 4).

A tumor developing from the spinal meninges, the roots or from the substance of the cord itself, unless it produces traction upon the sensory roots, or involves the pain fibers of the spinal cord, may produce very little, if any pain.

An intramedullary glioma may run a painless course. Occasionally we obtain a story that there has been pain for a number of months or even years, and then an abrupt cessation with recurrence months or years later. This is explained by the fact that the growing tumor within the canal reaches such a size that it slips from beneath or over the root and then lies free. It is only when the growth again reaches sufficient size to impinge upon the next sensory root that the pain returns. These remissions may at times be misleading and confusing.

The pain of spinal cord tumor has certain characteristics. It is usually a radiating pain and at times it may be stabbing and knife-like. The patient may complain of a boring or gouging pain. It is essentially a root pain, that is, it has a definite point of origin, a definite zone of extension and always ends in the same area. Associated with it may be certain subjective sensory phenomena.

The following story portrays the characteristic root pain in spinal cord tumor and illustrates the importance of recording chronologically the symptoms.

Case 3. Mrs. J. T. A white female, 43 years of age, seen in consultation with Dr. Wm. H. Anderson.

During the early part of August, 1927, she began to experience pain in the left side of her neck, radiating down the arm and into the left index finger. The pain was very sharp and always radiated into the same region. Gradually the pain extended into the other fingers of the hand and finally the thumb. The pain was increased on coughing, straining, laughing or turning the head. Several months later she noticed numbness beginning in the left hand and gradually extending into the left arm and shoulder. In March, 1928, she began to suffer some weakness and stiffness of the legs and had difficulty in walking. Just recently she has experienced "flashes" and pressure in both legs which she describes as "sky-rocket" sensations. This began in the hips and radiated downwards. Lately she has experienced urgency and frequency of urination and has noticed during the last several months a gradually increasing constipation.

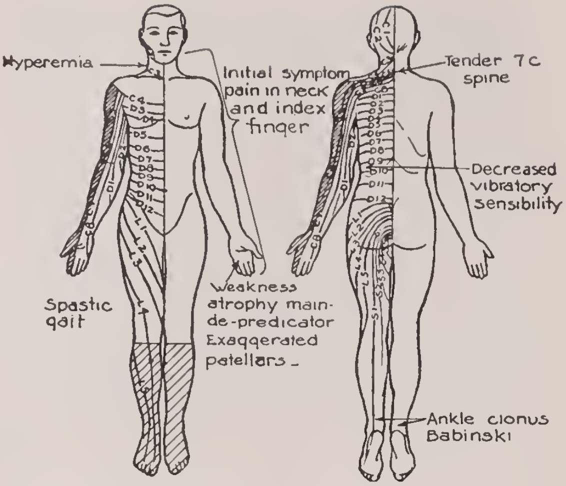
Hyperemia
Initial symptom pain in neck and index finger
Tender 7c spine
Decreased vibratory sensibility
Spastic gait
Weakness atrophy main-de-predicator Exaggerated patellars
Ankle clonus Babinski

Fig. 5. Case 3. Perineural fibroblastoma, fifth cervical root, left side.

The neurologic examination disclosed the following: Gait slow. There is some stiffness and scraping of the toes in walking. Tenderness over the seventh cervical spinous process with an area of hyperemia in a band-like distribution about the neck. There is decreased vibratory sensibility in the legs. The tuning fork is barely felt at the costal margins. Vibratory sensibility is decreased in the left arm up to the tip of the shoulder. There is hypesthesia, hypalgesia and decreased thermal sensibility in cervical segments five, six and seven. This is especially noticeable along the back of the left arm. There is diminished light touch below the knees bilaterally, weakness of both legs, weakness of the left grip and atrophy of the intrinsic muscles of the left hand and left shoulder girdle. Both thenar and hypothenar eminences of the left hand are decidedly flattened. The fingers of the left hand are in typical main-de-predictator position. Patellars are greatly exaggerated and arm reflexes in the left are quite hyperactive. There is a bilateral Babinski and ankle clonus.

An opportunity to carry out the manometric studies was not possible but a clinical diagnosis was made of cord tumor involving the fifth cervical segment on the left side, extramedullary.

At operation a perineural fibroblastoma was removed from the sensory root of the left fifth cervical segment (fig. 5).

A tumor involving the cauda equina frequently provokes pain, beginning in the back low down, radiating into one or both lower extremities. In the beginning it is usually unilateral but later, when the growth reaches sufficient size to impinge upon the opposite root or to compress the roots against the opposite bony wall of the canal, the pain then becomes bilateral.

Patients suffering from spinal cord tumor are peculiarly susceptible to nocturnal pain (relaxation of the muscles and vertebral ligaments during sleep). Usually it comes on about 2 or 3 o'clock in the morning. On retiring there may be freedom from pain only to be awakened during the early morning hours by a paroxysm of pain. They usually get up and assume peculiar attitudes, learned from experience that bring relief, or they may spend part of the night sitting in a chair or kneeling beside the bed. These positions are taken to relax the tension in the involved spinal roots. This mechanism occurs principally in those tumors involving the lower parts of the cord and the cauda equina. Changes in the weather have very little, if any, influence on the pain caused by cord tumor. Any condition putting sudden strain or increased pressure in the spinal subarachnoid space will aggravate the pain. This accounts for paroxysms of pain on sneezing, coughing, laughing or straining. Likewise sudden jarring of the spine in stepping from the curbing or in riding over uneven roadways will frequently provoke pain. Cervical cord tumors sometimes produce stiffness of the neck and oftentimes these patients complain of pain whenever the head is flexed or rotated.

Many patients suffering from spinal cord tumor will asssume a peculiar gait, walking in a protected manner, holding the muscles of the back tense and picking their steps in order to better protect themselves against sudden jarring. They avoid any sudden movement. There are others, especially when the tumor is in the cauda equina, who drag the toes and frequently assume a "steppage" gait, due to the weakness of the peroneal groups.

A very common symptom is some disturbance in sensation. There are cases of tumor of the cord which run a long course with practically no disturbance in the sensorium. These are in the minority, however. The following is an excellent example of such a case:

Case 4. J. K., a white male, 45 years of age. Seen in consultation with Dr. Harry Friedman, at Virginia Mason Hospital.

For several years, the exact duration being indefinite, he has had pains and soreness in the lower part of his back with gradually increasing stiffness of the back. He first noticed a severe, sharp pain under the left lowest rib two years ago. This pain was increased on walking so that his steps had to be selected with care. He gradually developed a swelling in both legs.

On examination he showed a normal sensorium and no disturbance in the motorium. The reflexes, including the deep and superficial, were without exception normal. There was bilateral edema of both lower extremities. The vertebral spine was negative for local tenderness. Lumbar puncture showed a marked xanthochromia with spontaneous coagulation of the fluid and negative manometric tests.

A diagnosis of spinal cord tumor, at about the level of the ninth thoracic segment lying on the left ventrolateral aspect of the cord, was made.

Operation revealed an intradural, olive-shaped tumor, lying opposite the ninth and tenth thoracic segments on the left ventrolateral aspect of the cord. Pathologically it was a perineural fibroblastoma (fig. 6).

Following the pain stage perhaps by several months, or possibly years, there are usually slowly developing subjective sensory disturbances. There may be numbness, burning, tingling or any number of perverted sensations in the trunk or extremities. Often the legs have a "deadened" feeling. These disturbances in sensation may vary from slight hyperesthesia to most profound anesthesia.

Frequently the patient describes a narrow band of hypersensitiveness about the abdomen or chest or a strip of hypersensitive skin along the arm or leg. In the regions innervated by the cauda equina there may be hypersensitiveness to touch over the buttocks, around the anus or genitals. In the beginning the sensory disturbances are irritative. Later, when the growth has reached sufficient size to produce vascular occlusion or compression, these sensory disorders give place to anesthesias. Slowly developing segmental anesthesias are practically diagnostic of spinal cord compression.

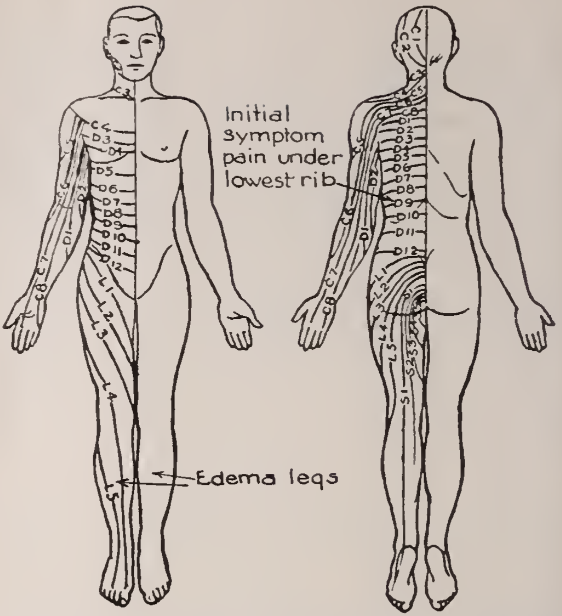

Fig. 6. Case 4. Perineural fibroblastoma, compressing 9-10 thoracic segments, left ventrolateral aspect.

The distribution of the disturbances in the sensorium will vary, depending upon the location of the lesion. At first they follow a narrow band of skin in the general direction of an extremity or in a band-like arrangement about the trunk, depending upon whether the lesion is in the cervical, thoracic or lumbar segments. Later on all the modalities below the level of the growth are included.

Usually, following the disturbances in sensation, appear disorders of motility. This may make its appearance either gradually or abruptly, but it is usually gradual in onset and may be purely segmental in character. That is, the muscles involved are those innervated by the particular segments wherein, or upon which the tumor lies. If it lies in the cauda equina or on the conus, the lower extremities will be the first to show weakness and the characteristic foot-drop. If in the cervical or upper dorsal regions, then the muscles of the arm, forearm and the intrinsic muscles of the hands and fingers will be impaired, depending upon the particular cord segment affected. Below the point of compression will be a gradually increasing spasticity and weakness of the lower extremities. These

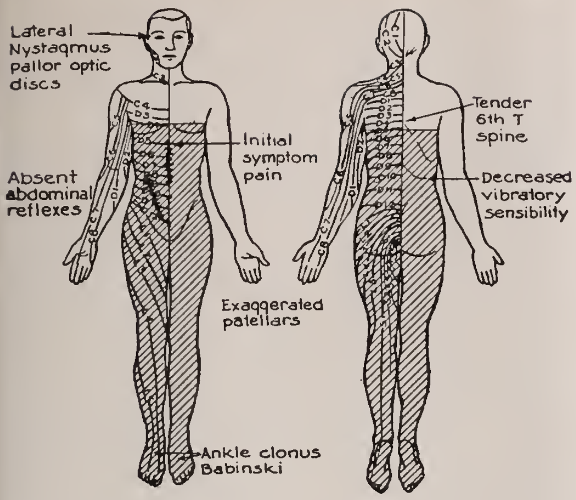
Lateral Nystagmus pallor optic discs
Absent abdominal reflexes
Initial symptom pain
Exaggerated patellars
Ankle clonus Babinski
Tender 6th T spine
Decreased vibratory sensibility

Fig. 7. Case 5. Extradural fibrous inflammatory mass compressing cord at fifth thoracic level.

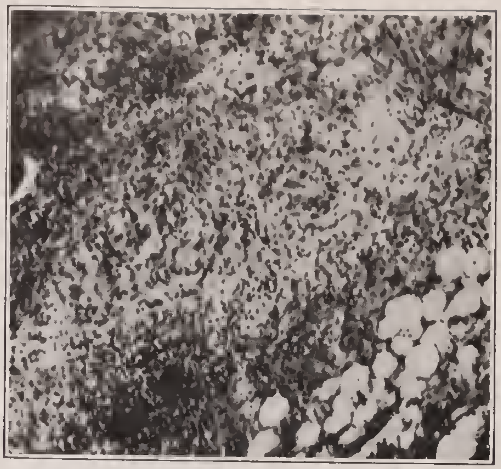

Fig. 8. Case 5. Photomicrograph of tissue showing chronic inflammatory reaction.

patients assume a characteristic spastic gait. After a period of months, or perhaps years, they are forced to bed and locomotion becomes impossible, due to rigidity. Practically all cord tumors, at some time during their course, involve the control of the sphincters.

At any time in the development of a spinal cord tumor we may encounter disturbances in the vasomotor control. Vasomotor paralysis in an extremity or edema of the legs, decubitus, hyperemia and glossiness of the skin may occur.

There is one group of cases beginning with neuralgic pains in the chest abdomen or extremities. Many are subjected to futile and harmful abdominal operations, to-wit, the following story:

Case 5. C. G. A white male, 27 years of age. Seen at King County Hospital.

During the past three years he has suffered from an obscure abdominal pain high up in the pit of the "stomach." Two years ago he was subjected to laparotomy. The appendix was removed. Later his gallbladder was removed. The pain was not relieved, occurring only periodically but intense in character. He has noticed during the last year a gradually increasing stiffness in the legs and diminished feeling below the nipple line.

Neurologic examination shows a slight, lateral nystagmus, a slight pallor of the optic discs, tenderness over the sixth thoracic spinous process, hypesthesia, hypalgesia and diminished thermal sensibility below the level of the fifth thoracic segment. Vibratory sensibility bilaterally decreased from the lower costal margins down. Greatly exaggerated deep reflexes in the lower extremities. Bilateral Babinski and ankle clonus, and absence of the abdominals. Lumbar puncture disclosed amber colored fluid, positive globulin and suggestive manometric findings of a partial subarachnoid spinal block.

A diagnosis of tumor of the spinal cord, impinging upon the fifth thoracic segment, was made.

Laminectomy revealed an extradural fibrous inflammatory mass opposite the fifth thoracic segment (figs. 7 and 8).

This pain stage may last for a period varying from months to years, followed in the course of time by sensory disturbances on the opposite side of the body. This may progress until both sides are involved and there is diminished sensation below the level. Lastly, there is a gradually developing spasticity of the extremities and disorders of the sphincters.

The second group begins with subjective disturbances in the sensorium and a sensation of pins and needles and tingling and numbness, followed by progressive loss of sensation in the contralateral half of the body. Later, bilateral sensory and motor disturbances, accompanied by sphincter involvement, make their appearance.

The next group includes those who are treated, oftentimes over long periods for so-called back strain, sarcoiliac disease, sciatic neuritis, enlargement of the prostate and other obscure conditions. These are the patients harboring tumors of the cauda equina or conus. As an example of the foregoing, let us follow the story of this patient:

Case 6., Mrs. P. C. A white female, 35 years of age. Seen in consultation with Drs. George Miller and O. F. Lamson at Providence Hospital.

Was well up to two and a half years ago. Has always had a constant coarse tremor of the right hand. Her trouble began with pains in the sacrum of a dull, aching character; at times sharp and radiating into the left leg. Sciatic neuritis was suspected and her tonsils were removed. Her condition improved for a period of eight months, during which time she was free from pain. In April, 1927, she began to have bilateral pains down both legs, radiating into the toes; also she observed a gradually developing numbness of both feet. The pain was aggravated on sneezing, coughing and straining at stool, and at times radiated around the crest of the ilium when coughing. She first began to experience difficulty in walking a year and a half ago, at which time she noticed that her toes dragged slightly and that she tripped easily. During

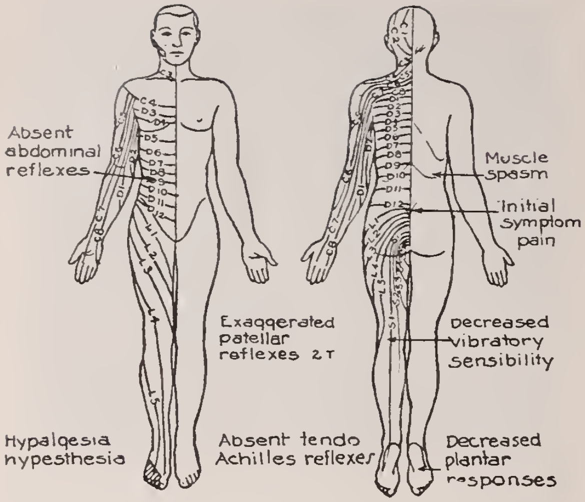
Absent abdominal reflexes
Muscle spasm
Initial symptom pain
Exaggerated patellar reflexes 2T
Decreased vibratory sensibility
Hypalgesia hypesthesia
Absent tendo Achilles reflexes
Decreased plantar responses

Fig. 9. Case 6. Intramedullary glioma conus (ependymal cell).

the last six months she developed an extreme weakness of both legs. She has suffered from constipation for years; this has not been progressive.

Neurologic examination showed the following: Patellar reflexes exaggerated 2 plus and equal. The tendo achillis reflexes could not be obtained and the abdominals were absent, the plantars decreased and there was decrease to light touch and pin prick in the second, third and fourth toes of the right foot and decreased vibratory sensibility below the knees on both sides. The lower back showed rigidity and muscle spasm.

Lumbar puncture revealed a pressure of 16 mm. Manometric tests showed a positive block and the fluid was amber colored. Nonne was strongly positive and there were 17 lymphocytes.

An intramedullary tumor in the region of the conus was suspected.

Exploratory laminectomy disclosed an intramedullary ependymal cell glioma of the conus (fig. 9).

Another group consists of those with increasing loss of power in both lower extremities, followed by disturbances in the sensorium and, lastly, sphincter involvement.

Diagnosis and localization of a spinal cord tumor may at times be an exceedingly difficult matter. During the last several years there has been an increasing interest in this subject but nevertheless the problem is still offering difficulties. Rand speaks of the many cases of cord tumor having had conflicting and erroneous diagnoses, at times leading to needless surgical procedures. Williamson believes that in any case with symptoms of spinal cord involvement it is well to consider the possibility of a spinal cord tumor.

A carefully taken, chronologic history of the onset and progression of symptoms will prove invaluable in arriving at a correct diagnosis and localization. It is well to make repeated sensory examinations. This should be done before and following the lumbar puncture, as there are cases which present very little, if any, disturbances in the sensorium until after the lumbar puncture. Following this a more accurate localization often can be made.

Roentgenogram of the spine is of value in the diagnosis of spinal cord tumor, more in the negative than in the positive way. In other words, a roentgenogram of the spine, wherein we suspect a lesion to be located, can at least eliminate gross bony changes. Lumbar puncture is an important mechanical aid in the diagnosis or confirmation of a cord tumor. The determination of the color and character of the spinal fluid, the presence or absence of an increased number of cells and the quantative globulin content materially aid in the diagnosis.

The manometric tests (Queckenstedt) are used in determining the presence or absence of a partial or complete subarachnoid block. A partial block is demonstrated by a slow rise or a slow fall of the manometric fluid level. Complete obstruction occurs only in a small percentage of cord tumors and for this reason we should not rely too much upon these tests, if they are negative. Elsberg has shown that over fifty per cent of spinal cord tumors fail to show a positive block.

In the differential diagnosis, especially those cases with symptoms of low spinal cord or caudal involvement, certain conditions simulating neoplasm must be eliminated. One of these is neuritis of the roots of the cauda equina. It may be a difficult matter to rule out tumor in those cases with root pain, lymphocytosis of the cerebrospinal fluid and hyperesthesia over the buttocks and lower extremities, due to neuritis or inflammatory condition of the cauda equina. A carefully taken history, quantative globulin and cystologic study of the cerebrospinal fluid constitutes our most reliable source of information.

Angioma is occasionally mistaken for spinal cord tumor. Also disseminated sclerosis of the spinal type may at times present such a picture that it is impossible to rule out a spinal cord tumor without exploratory laminectomy.

Occasionally spinal cord symptoms plus blood findings of a primary anemia are confusing. The following story is of unusual interest:

Case 7, C. T. A white male, 61 years of age. Seen in consultation with Dr. H. J. Wyckoff.

Was in good health until two and a half years ago, when he began to experience pain under the left shoulder blade. Six months later he began to notice weakness of both legs and a "springing" sensation in the feet at the same time. This gradually increased until it became difficult for him to walk on account of stiffness.

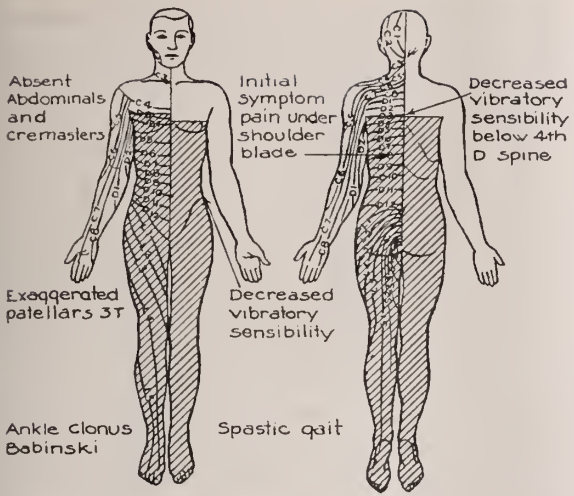
Absent Abdominals and cremasters
Initial symptom pain under shoulder blade
Decreased vibratory sensibility below 4th D spine
Exaggerated patellars 3T
Decreased vibratory sensibility
Ankle clonus Babinski
Spastic gait

Fig. 10. Case 7. Extramedullary arachnoid fibroblastoma on left side of cord opposite third segment.

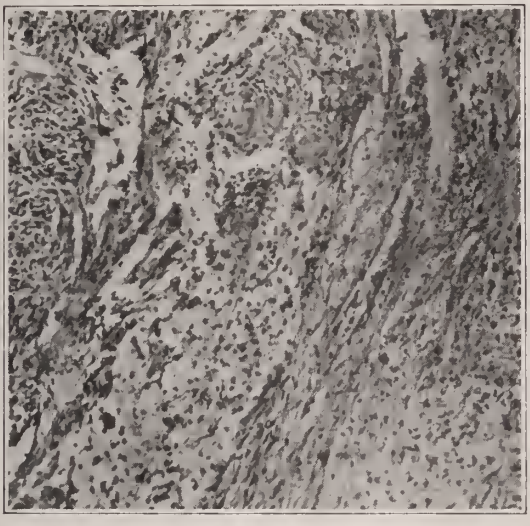

Fig. 11. Case 7. Photomicrograph of section from arachnoid fibroblastoma.

The neurologic examination showed pale discs with vessels of the arteriosclerotic type. He was unable to stand or walk without assistance. The gait was slow and scraping and his legs decidedly spastic and ataxic. Both legs showed diminished power. The sensorium presented hypesthesia and hypalgesia below the third thoracic segment, slightly higher on the right side. There was decrease of vibratory sensibility below the hips and no local tenderness of the spinous processes. There was diminished vibratory sensibility below the fourth dorsal spine. All of the deep reflexes were markedly exaggerated, three plus in the legs. A bilateral ankle clonus, Babinski and Chaddock were demonstrated and the abdominals and cremasters were absent. No history of vesical or rectal disorder.

The interesting and conflicting part of the case now presented. The hemoglobin was 50 per cent and the red cells 3,100,000 with 10,600 whites. No megaloblasts seen.

The pathologist's report was as follows: "The blood picture is that of a primary anemia." Repeated blood studies showed the same picture.

Lumbar puncture showed the fluid slightly amber colored, Nonne positive, pressure 30 mm. and the manometric tests gave positive evidence of a complete spinal arachnoid block.

It was thought that he was suffering from a tumor of the spinal cord, involving the third dorsal segment, extramedullary and on the left side, associated with a primary anemia.

An extramedullary arachnoid fibroblastoma on the left side of the cord, opposite the third dorsal segment, was removed (figs. 10 and 11).

## SUMMARY

The prognosis in spinal cord tumor is fairly good, being over forty per cent, if the diagnosis is made before complications or cord degeneration result. Although the first spinal cord tumor was reported in 1792 by Phillips, it was not until 1887 that the first successful surgical operation was performed by Gowers and Horsley.

Tumors of the spinal cord may occur at any age. Trauma plays small part in the etiology. Symptoms of spinal cord tumor occasionally begin during or following pregnancy. Protracted pain, without adequate physical cause, may be due to spinal cord tumor. A few cases occur without pain. The pain in cord tumor has, as a rule, definite characteristics. It is always radicular. Following the painful stage, sensory and motor symptoms ensue, accompanied by sphincter disturbances. Vasomotor disorders occur in certain cases.

Four general groups of symptoms and chronologic development are recognized from the clinical standpoint. Roentgen-ray examination is usually negative. Examination of the cerebrospinal fluid and manometric studies should always be performed. The differential diagnosis may at times be difficult. Tumor must be differentiated from disseminated sclerosis, angioma and system disease, also neuritis of the cauda equina.

## CONCLUSIONS

1. Seven surgically verified cases of spinal cord compression are reported (six neoplasms).

2. The diagnosis depends upon a carefully taken chronologic history.

3. Diagnosis and localization of tumor calls for a thorough general and neurologic examination.

4. Examination of the cerebrospinal fluid with manometric tests should always be carried out.

5. Roentgen-ray examination is necessary to rule out malignant disease or gross bony changes.

6. Spinal cord compression usually progresses through three stages. These are pain, disturbances in sensation and disturbances in motility.

Medical Dental Bldg.

# SURGERY OF THE SYMPATHETIC NERVOUS SYSTEM AND CHRONIC ARTHRITIS*

Paul G. Flothow, M.D.
SEATTLE, WASH.

Royle's epochal work of 1924,[1] designed to relieve spastic paraplegia, has proven a potent stimulus to the study of the sympathetic nervous system. In the past three years many contributions have been made to our knowledge of the anatomy and physiology of the sympathetic nervous system, and the surgical application of this knowledge.

## ANATOMY

The term sympathetic nervous system is not accepted by many who prefer to combine the sympathetic and the parasympathetic systems under the term autonomic nervous system. The sympathetic is the thoracicolumbar outflow, the parasympathetic is the craniosacral outflow.

We will deal only with the thoracicolumbar portion of the autonomic nervous system, which consists of a double ganglionated chain of nerve tissue, extending practically the entire length of the vertebral column on either side. The chains consist of trunk, ganglia and rami. The ganglia tend to follow a segmental distribution except in the cervical region, where there are usually only three ganglia. In the thoracic portion the pattern is fairly constant, but in the lumbar region there are frequent variations. While there are segmental ganglia in the cervical, lower lumbar and sacral regions, these ganglia have no direct central connection.

The preganglionic white rami, forming the central connections with the spinal cord, are present only from the first thoracic to the second lumbar ganglia. We utilize this fact in both the dorsal and the lumbar sympathetic operations. There are no preganglionic rami above the first thoracic ganglion. There are no postganglionic rami to the brachial plexus below the second thoracic ganglion. By removing the first and second thoracic ganglia together with the trunk, and severing all rami, we interrupt all sympathetic fibers to the brachial plexus. This also applies in the lumbar region. There are no preganglionic fibers below the second lumbar ganglion. There are no postganglionic fibers distributed to the major nerves of the lower extremity below the fourth lumbar ganglion. Removal of the second, third and fourth lumbar ganglia together with the trunk, and severing all rami, interrupts all sympathetic impulses to the lower extremity.

From the various ganglia and frequently from the trunk itself arise numerous postganglionic fibers known as gray rami. These may be divided into those laterally and those medially directed. The laterally directed rami reenter the spinal nerves and are distributed to blood vessels, sweat glands, hair follicles and, we believe, to striate muscle. The medially directed rami are distributed to the smooth muscle and the vessels of the viscera, usually by way of the large thoracic abdominal and pelvic nerve plexuses, where they are in close relationship with the craniosacral outflow. This close anatomic relation of sympathetic and parasympathetic elements is also found in the various ganglia of the head. Some investigators believe that parasympathetic elements are also present in the spinal nerves. This is interesting in view of their close functional relationship.

Ransom,[2] Kuntz,[3] Kramer,[4] Todd, Potts[5] and others have done much to advance our knowledge of the anatomy of the sympathetic nervous system.

## PHYSIOLOGY

Our knowledge of the anatomy of the sympathetic system, while far from exact, is more definite than our knowledge of its physiology. The scope of this paper does not include a discussion of the various controversial points on either its anatomy or physiology. Almost any statement made as to the physiology may arouse criticism. However, some of the functions are generally accepted as established.

Most therapeutic surgical applications are based on sympathetic function in regard to vasomotor control. We know that vasomotor constrictor fibers are sympathetic and that interruption of the sympathetic fibers to a portion of the body causes a vasodilatation of that portion with consequent increase in temperature. The sympathetics, in relation to the vascular bed, are the regulators of vascular tone. Whether or not any other mechanism affects vascular tone is undetermined. We know that occasionally areas which have had sympathetic denervation regain a certain amount of vascular tone. Whether this is due to incomplete denervation or to some other mechanism is one of our problems. We believe that there must be some other mechanism carried either in the spinal nerves or present in the vessel wall which takes over a certain amount of vasomotor control after sympathetic enervation has been destroyed.

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* From the Neurosurgical Clinic.

* Read before the Fifty-sixth Annual Meeting of Oregon State Medical Society, Portland, Ore., Sept. 17-19, 1930.

We recently did a bilateral dorsal sympathetic ganglionectomy upon a six year old child who had a left lumbar ganglionectomy six months previously. Ever since the lumbar ganglionectomy, the left leg has been from 10 to 15° F. warmer than the right and markedly pinker. Within six hours after the second operation, the rectal temperature rose to 108° F., probably due to an increased blood supply to the thermic centers. At the height of the fever a baffling condition was present. The left leg, which had been denervated six months previously, and which had been 10 to 15° F. warmer and pinker than the right, was absolutely ice cold. The unoperated side was very hot, together with the rest of the body. Here the picture has been exactly reversed by the dorsal sympathectomy. The temperature quickly dropped and within twelve hours was practically normal but the left leg still remained very cold. It gradually began to warm from above downward. On the second day only the toes were cold and forty-eight hours after the onset of the phenomena the picture was as before, the left leg being much warmer than the right.

In this case we have the phenomenon of a desympathectomized limb which had been in a constant state of vasodilatation, going into a state of almost complete vasoconstriction within a few hours after a bilateral dorsal ganglionectomy. This phenomenon is unexplainable in the light of any accepted knowledge of the physiology of the sympathetic nervous system. It indicates that there is some mechanism by which vasoconstriction can occur after all sympathetics have been severed.

Among the other functions of the sympathetic system are those of the control of sweat glands and pilomoter and glandular functions. Whether or not sympathetic fibers have any relation to tonus of striate muscle is a mooted question. Kuntz,[6] Bocke,[7] Agduhr,[8] Hunter[9] and others have demonstrated sympathetic fibers ending in striate muscle. Wilkinson[10] has been unable to demonstrate these fibers. However, the fact remains that sympathetic operations do have some effect upon tonus of striate muscle. I recently visited Dr. Royle in Sydney. I observed his work, saw his cases and his experimental animals. Since this visit I am convinced that sympathetic fibers do influence muscle tonus. This influence may be vascular, or it may be due to increased blood supply to the spinal cord.

While we are not primarily interested in the visceral functions of the sympathetics in this paper, any discussion of the physiology would be incomplete, if they were not mentioned. The sympathetic and parasympathetic visceral functions are closely synchronized. That they act as antagonists is not exactly true. We feel that the functions of the two systems are complementary rather than antagonistic. Recent physiologic investigations have shown that the reactions to stimuli applied to sympathetics and parasympathetics are not necessarily specific but depend largely upon the state of the organ at the time the stimulus is received.

Anatomically and physiologically the sympathetic visceral fibers and the parasympathetics are closely related. It is thought that the sympathetics have a great deal to do with sphincteric functions from esophagus to anus. It is probable that sympathetics supply the motor mechanism of the sphincters, while parasympathetics supply those of lumens. We know that when the sympathetics are paralyzed, as in spinal anesthesia, there is active contraction of the lumen of the bowel and simultaneously a relaxation of the sphincters. It is also thought that the sympathetics have a stabilizing effect upon tonus of viscera. These functions are the ones upon which the surgical treatment of Hirschsprung's disease and chronic constipation are based.

I am avoiding the question of visceral pain and sympathetic afferents except to state that I believe that sympathetics undoubtedly carry afferent pain fibers. It is only recently, however, that these ideas are being proven. It has been only in the past year or so that the majority of authorities have been willing to admit the presence of any afferent fibers in the sympathetic nervous system. I have reported cases which give clinical support to the belief that the sympathetic system does carry afferent pain fibers.[11]

It is upon this anatomic and functional knowledge that sympathetic surgery in the following disease conditions is based:

1. Raynaud's disease.
2. Thromboangeitis obliterans (Buerger's disease).
3. Generalized scleroderma.
4. Hirschsprung's disease and chronic constipation.
5. Spastic paraplegia.
6. Chronic arthritis.

While this is far from being the entire list of conditions amenable to sympathetic surgery, it comprises the ones most generally accepted.

1. Raynaud's disease is a pure disease of vaso-

constriction and as such results in absolute cure when all sympathetic fibers to the affected portions are destroyed, and vasodilatation replaces the vasoconstriction.

2. Buerger's disease is an obliterating endarteritis, frequently associated with vasospasm. In the type in which the vasospastic element is marked, much relief and preservation of limbs results from early sympathetic surgery, again by the vasodilating effect.

3. Generalized scleroderma, a thickening and hardening of the skin and all body tissues, has been found to respond to sympathetic surgery, if not too far advanced. The improvement is probably due to the increased circulation. This disease is frequently associated with Raynaud's disease.

4. Hirschsprung's disease. No cases of this condition have yet been reported, in which proper sympathetic surgery has failed to give complete functional relief. Chronic constipation of the spastic type, severe enough to warrant operative measures, has resulted almost invariably in complete relief. In these conditions the primary cause is probably functional sphincteric spasm which is relieved by removal of the left first and second lumbar sympathetic ganglia or the medially directed fibers.

5. Spastic paraplegia. Results of sympathetic surgery in this condition were discussed in the section on physiology. It appears at the present time that necessary tenotomies, plus sympathetic surgery, plus reeducation, offer these patients more than any other type of treatment.

6. Chronic arthritis. Rowntree[12] in 1926 first suggested that the circulatory effects of sympathetic ganlionectomy be applied to chronic periarticular deforming arthritis. Since then Adson[13] has several times reported excellent results. Some time ago I made a favorable preliminary report.[14] An associate recently received a letter from a friend in Japan, reporting that a Japanese had performed sympathectomy in one hundred and twenty cases with uniformly excellent results. Up to now all reports have been favorable.

### FUNCTIONAL BASIS OF THE OPERATION

We know from the results of sympathetic operations, performed for other conditions, that there is an increase of temperature and a capillary and arteriolar dilatation, following interruption of sympathetic impulses to the part involved. We know, further, that the increased temperature and the improvement in circulation are permanent. The benefits of local heat in arthritis are well known. With this knowledge it is not unreasonable to expect actual structural improvement in the involved joints as a result of the improved circulation and we have found this does occur.

The relief of pain, following operation in Raynaud's and Buerger's diseases, is probably due to interruption of sympathetic afferent fibers. One may argue, however, that it is due not to interruption of afferent fibers but to the resulting vasodilatation. The fact that blood vessels are extremely sensitive to pain must be admitted. We know of no nerve pathways other than the sympathetics which could carry painful stimuli from blood vessels. The fact that cold weather and barometric changes cause increased pain in arthritis could justify the assumption that arthritic pain is a vascular type of pain and as such is carried by sympathetic afferent fibers. On this assumption we could expect sympathetic operations to relieve arthritic pain. That this does occur is unquestionably true.

### TYPES SUITABLE FOR OPERATIONS

Adson, Rowntree and Brown carefully select their cases. They routinely do temperature studies and select only those cases having a favorable vasomotor index. They advocate as the suitable type the younger individuals with a chronic, progressive periarticular arthritis, the ones having cold, clammy, painful joints with evident oversympathetic stimulation. They further state that actual destructive changes in the joint surfaces are a contraindication. If we are to expect complete cures, it is probably only in this type that we will get them. But are we justified in withholding the favorable results of the operation from the more advanced and even from the cases heretofore considered unsuitable? We feel that our results justify a much wider application.

We wish it to be understood that we do not advocate sympathectomy as an early treatment of progressive arthritis. We feel that surgery should be advised only after the removal of all foci, and the trial of all known therapeutic measures. If, in spite of all treatment, the condition progresses, we advocate surgery and the earlier it is done the better. We have operated on cases in the very unsatisfactory type with excellent results. We feel that the operation is justified even in advanced cases, where all we can expect is relief of pain.

### RESULTS

Up to the present time we have only five cases to report. All of these have been advanced ones, with marked pariarticular bony changes and in four of them the joint surfaces were involved.

The ages of our cases were twenty-one, thirty, forty-three, forty-five and fifty-seven. The duration of the disease varied from six to fourteen years.

In every case there was immediate relief of pain which has been permanent. In every case there has been immediate improvement in joint function which has been progressive. Our first two cases had been bedridden for months and both have been discharged from the hospital, able to take care of themselves and to make their way about. In every case to date our results have been much better than we had hoped for.

### EXPLANATION OF RESULTS

1. Relief of pain. We believe as a consequence of the invariable relief of pain following operation that the pain of chronic arthritis is almost entirely of vascular origin. We believe that the relief of pain ensues as a result not only of vasodilatation but of an actual interruption of afferent sympathetic pain fibers.

2. Improvement of joint function. The immediate improvement is, we believe, due largely to the relief of pain which in turn relieves the muscle spasm which is splinting the joints as a protective measure. When pain on motion ceases this protective splinting is no longer necessary and the muscles relax. The progressive improvement is, we believe, due to the improved blood supply of the joint and an actual improvement in the bony and periarticular changes.

3. Increased warmth. This, of course, is due to the vasodilatation which always results when the sympathetic tracts are destroyed.

### TECHNIC OF OPERATIONS

#### *Lumbar sympathetic ganglionectomy.*

1. Abdominal approach. In this operation it is necessary to open the peritoneum and retract the abdominal contents to expose the sympathetic chain as it courses along the bodies of the vertebrae between them and the medial border of the psoas muscle. In some cases we have found it necessary to place the intestines out on the chest in order to get adequate exposure. The advantage of this operation is that both sides may be done in one operation. Its disadvantages, we feel, more than offset this advantage. It is a long tedious operation. It is necessarily accompanied by a certain amount of shock and too frequently is followed by serious postoperative complications.

2. The lumbar approach devised by Royle. This operation is entirely extraperitoneal. It is done through an incision similar to that used for kidney operations. The abdominal muscles are separated from the crest of the ilium and the sympathetic chain exposed by retracting abdominal contents medially.

The advantages of this approach are manifold. It is quickly performed. It is unaccompanied by shock. It is entirely extraperitoneal and the abdominal contents are not disturbed. Consequently postoperative abdominal complications rarely occur and the mortality is negligible. Furthermore, the exposure is much more adequate than by the abdominal approach.

Its only disadvantage is that only one side can be done at a time. We feel that is safer and more satisfactory than the abdominal approach and have, therefore, adopted it.

#### *Dorsal sympathetic ganglionectomy.*

1. Anterior approach of Royle. This is done through a small incision above the clavicle. The sternomastoid is retracted or a portion of it is severed and likewise the anterior scalenus. By blunt dissection the dome of the pleura is exposed behind the anterior scalenus. Sibson's fascia is severed and the sympathetic trunk exposed on the neck of the first rib. The trunk is then severed below the first thoracic ganglion.

The advantages of this approach are the ease and rapidity with which it is performed. Its disadvantage is that we feel it is incomplete. In merely severing the trunk below the first thoracic ganglion, white rami to this ganglion are left intact. Furthermore, there are frequently direct connections between the second thoracic ganglion and the brachial plexus, not only through the intrathoracic ramus described by Kuntz, but also by way of sympathetic rami going directly from the second thoracic ganglion into the first thoracic nerve. We do feel, however, that it may be possible to do a complete operation through this approach. In one case we were able to remove the first thoracic ganglion and obtained a very satisfactory result. With more experience in this approach, the second ganglion may also be removable. If this is true, this will undoubtedly be the approach of choice.

2. The posterior Henry-Adson approach. This consists in a removal of a portion of the first or second rib, together with the transverse process. The sympathetic trunk is found lying on the pleura between it and the lateral aspects of the bodies of the vertebrae. Through this approach the first and second thoracic ganglia together with the intervening trunk are conveniently removed.

The only disadvantage of this operation is that it is more time consuming, more mutilating, and more difficult than the anterior approach. Its great advantage and the thing that causes us to prefer it lies in the fact that, when it is properly done, it completely denervates all sympathetic fibers to the brachial plexus. Royle feels the avoidance of Horner's syndrome is an advantage of his approach. In our last two cases, in which the posterior approach was used, we have left the inferior cervical ganglion intact and have had only a temporary Horner's syndrome.

### CONCLUSIONS

Sympathetic ganglionectomy is indicated in all cases of Raynaud's disease, in Buerger's disease where there is a large vasospastic element, in generalized scleroderma, in selected cases of spastic paraplegia, in severe cases of spastic constipation and Hirschsprung's disease, and in chronic progressive polyarthritis.

In suitable types of chronic arthritis, such as the young individuals with cold, clammy, painful extremities, without evidence of joint destruction, we may expect complete cures as a result of proper sympathetic surgery.

In the more advanced types the operation results in immediate relief of pain, immediate and progressive improvement in joint function and actual improvement in the structure of the joint.

Chronic progressive arthritis at last enters the disease class, in which we have a very definite surgical therapeutic measure of great value. No patient should be allowed to go on to the stage of disability. If the condition progresses in spite of all treatment, carefully carried out, sympathetic operations should be performed. The earlier operation is performed, the better is the prognosis of cure.

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# ACUTE DIFFUSE SEPTIC MENINGITIS*

## ITS TREATMENT BY INTRAMUSCULAR INJECTION OF AUTOCEREBROSPINAL FLUID. PRELIMINARY REPORT

J. T. Rooks, A. M., M. D.
WALLA, WALLA, WASH.

Acute meningitis is one of the most deadly of infections. Even in the epidemic type caused by the meningococcus the mortality rate, in spite of the use of specific serum, is still exceedingly high. In some epidemics death often occurs before a diagnosis has been made with certainty, while in the diffuse septic type the prognosis is so unfavorable that death is to be expected in nearly all cases.

Whether the pneumococcus or the streptococcus is the more deadly when once it has invaded the central nervous system is questionable. However, there seems to be an impression among many physicians that a pneumococcal infection of the meninges is more virulent than that caused by the streptococcus, and yet, as far as I have been able to ascertain from studying case reports, there is no evidence recorded to substantiate this impression.

In discussing the treatment of pneumococcal meningitis, Cole[1] says he knows of no method which has been demonstrated to be successful. All of his cases ended fatally and he adds, further, that he has not personally known of a single case in which the diagnosis has been made with sufficient attention to bacteriologic technic to meet all objections, in which recovery has taken place. Ballenger[2] recently reported fourteen cases of streptococcal meningitis and ten of pneumococcal. In all but one of the twenty-four cases death occurred in from one to fifteen days. The one exception was taken from the hospital in a dying condition and the final outcome is unknown. He reported one recovery from staphylococcus aureus.

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*Read before the Forty-first Annual Meeting of Washington State Medical Association, Mount Baker Park, Wash., Sept. 2-3, 1930.

Pneumococcal meningitis has been recognized by various observers as a complication of pneumonia, ranging from ½ to 2½ per cent, and in Osler's Montreal series it reached 8 per cent. As a complication of suppurative otitis media or as a sequel of mastoiditis, septic meningitis is said to be not uncommon and has often been known to originate from an infection in the nasal accessory sinuses.

Of the various types of the pneumococcus it is questionable whether we should consider one type more severe than another, since in all cases the mortality rate invariably approaches so closely the 100 per cent mark that the prognosis is considered hopeless. Bauer and St. Clair[3] reported four cases complicating otitis media and five cases of primary pneumococcal meningitis. The former four were equally divided between types III. and IV. Of the latter five one belonged to type I. and four to type IV. All of these terminated fatally. Of the primary cases the longest duration of life after the onset of meningeal symptoms was three days in one case. Two of these patients died within twenty-four hours from the time the disease was recognized.

Christensen[4] reported a series of sixteen cases, five each of types I. and III. and six of type IV. All of them terminated fatally. In 1927, after a complete review of the literature, Goldstein[5] estimated that there had been only about 150 cases of recovery from pneumococcal meningitis reported. His treatment is heroic, consisting of radical drainage and lavage of the ventricles and meninges with antiseptic solutions such as mercurochrome-220, neutral acriflavine, metaphen and ethylhydrocuprein.

Globus and Kasanin[6] and also Harkavy[7] mention numerous isolated recoveries. In these cases usually recovery was attributed to the employment of measures similar to those used by Goldstein, but Harkavy believes that the fundamental problem in the treatment of pneumococcal meningitis is to influence the disease favorably by means of specific serum therapy. His one case that recovered was of type I. Stewart[8] is a strong advocate of the use of ethylhydrocuprein and emphasizes the necessity of bringing all regions of the meninges into frequent contact with the therapeutic agent, the value of which he was able to demonstrate on experimental animals.

Kolmer[9] places the greatest emphasis on early treatment. He cured 60 per cent of his cases of experimental pneumococcal meningitis in dogs by injecting pneumococcidal agents directly into both common carotid arteries, combined with cisternal drainage and intracisternal medication, providing the treatment was instituted at the onset of the signs and symptoms of the disease. But we must not overlook the fact that in these experimental cases the diagnosis was known even before the first symptom of meningitis appeared, which simplified Kolmer's task wonderfully and placed his problem wholly without the realm of clinical experience.

All writers on the subject seem to agree that whenever possible the primary focus must be thoroughly eliminated, a fact which I wish to emphasize. Infected paranasal sinuses must receive proper attention and it is equally imperative that all necrotic bone be completely removed, regardless of the structures involved. The recognized treatment, therefore, is radical to the extreme, and, considering the uncertain results, never justifiable except in the hands of the most skillful expert and under ideal conditions. The average physician does not see many of these cases in the course of a life time, a point which must be kept in mind, when these heroic, radical measures are to be adopted. Therefore, a more simplified therapy, if it offers even a modicum of success, is worthy of the most careful consideration.

Beginning in 1923 Spanyi[10] treated ten cases of tetanus with 70 per cent of recoveries by reinjecting 5.00 to 10.00 c.c. of cerebrospinal fluid under the skin of the thigh one or more times. Of course, he also employed serum and narcotic agents. Another series of four cases treated in like manner by the same author recovered without a single fatality. Of still another series of twenty-seven cases, which he treated without the reinjection of cerebrospinal fluid, 56 per cent died. He has also employed this method in the treatment of tetany, meningitis, eclampsia, etc.

In 1929 Mariotti[11] reported favorable results from the intravenous injection of cerebrospinal fluid in various pathologic conditions of the central nervous system, especially chronic infections. He states that the method is readily tolerated and causes no disturbances whatever.

In April, 1930, Lauzer[12] reported a series of thirteen cases of epidemic cerebrospinal meningitis treated by the intramuscular reinjections of autocerebrospinal fluid, with prompt complete recovery in all cases but one. The duration of the disease in his series varied from six to twenty-seven days. Like Mariotti, Lauzer found the method to be harmless, causing not the slightest local reaction and in all cases apparently having a favorable influence on the course of the disease.

My experience with this method of treatment is limited to two cases. The first of these was diagnosed tentatively as type I. pneumococcal meningitis, as the exciting microorganism, when examined in direct smears of the cerebrospinal fluid. It was a lancet-shaped encapsulated gram-positive diplococcus, and the cerebrospinal fluid was precipitated by type I. pneumococcal serum; but unfortunately, owing to unavoidable tragic circumstances, the bacteriologic investigation was not completed. The exact bacteriologic diagnosis, therefore, may be questioned. The second case was also caused by organisms which were morphologically similar, when examined in the direct smears of the cerebrospinal fluid to those observed in the first case. However, the identity of these organisms in the second case was finally established by cultural and other characteristics as the nonhemolytic streptococcus.

My attention was first called to this method of treating cerebrospinal meningitis by an associated press report of Lauzer's work. At that time I had just performed a mastoid operation on case 1 of my series. This patient was almost moribund and we could offer absolutely no hope whatever. Death appeared to be only a question of a comparatively short time. I was in a mood to try anything suggesting the faintest ray of hope, as matters could hardly be made worse. The little patient, being one of my personal friends, made the problem the more serious for me.

The general reaction of some members of the medical profession to this method of treatment is peculiar. The dangers of its causing serious complications are set forth with emphasis and skepticism. The parents of my first case were warned against it by the laity and indirectly by physicians, disregarding medical ethics and professional decorum. As a preface to Lauzer's report, even the editor of the *Medical Sentinel* sounded a solemn warning. He said that, in spite of the apparent harmlessness of the method in the hands of the author, we cannot help wondering if there may not be serious dangers. However, after all of these warnings not one person, as far as I know, has ever made a specific statement as to what a single one of these dangers may be.

Believing that I was dealing with a pneumococcal infection, and considering the seriousness of the clinical picture, a fatal ending appeared obvious. This was confirmed by numerous consultations. In such a crisis the possibility of the intramuscular injection of purulent cerebrospinal fluid causing local abscesses or even septicemia were not to be given a thought. I, therefore, elected to try this new method of treatment. The results can be stated in no better way than by presenting an outline of the clinical course of each case.

Case 1. Female child, age 7 years, slightly undernourished and underdeveloped. Her first signs of sickness were noted on November 16, 1929, and were characterized by more or less slight indefinite symptoms, such as general malaise and loss of her usual activity. On November 18, she complained for the first time of pain in her right ear and two days later the right drum membrane was found to be red and bulging and was lanced. Following the paracentesis the middle ear drained profusely until the third day of December, when the discharge became lessened and the patient's condition grew worse rapidly.

On the afternoon and night of December 2, she complained of severe pain over the forehead and vomited at intervals, which no doubt marked the onset of meningitis. When admitted to the hospital on the morning of December 4, her complexion, which was normally fair, was described as ashen. She had but little to say and scarcely noticed anyone. Her heart was rapid. Her pulse was bounding and registered 140 per minute. Her respiration was 28 and temperature was 103°. When testing for the Babinski sign there was a slight tendency for the toes of the left foot to fan. Otherwise the deep and superficial reflexes were absent. Her neck was stiff. Kernig's sign was doubtful.

Her cervical lymph glands were palpable, although her tonsils and adenoids had been removed and her throat was in good condition. Her thyroid gland was not enlarged. There was a slight purulent discharge from her right middle ear. The superficial tissues over the mastoid area were normal in appearance. No tenderness could be elicited over either mastoid and her mother stated that there had been none at any time. There was no evidence of organic disease of the heart or lungs but the patient's general condition was that of a profoundly sick child.

Roentgen report. Haziness and blurred appearance of the right mastoid cells, due to the presence of infection and granulations.

Clinical laboratory report. Erythrocytes 3,000,000, total leucocytes 22,000, polys 93 per cent, small lymphocytes 5 per cent, large lymphocytes and large mononuclears, 1 per cent each. The cerebrospinal fluid was cloudy and contained 4,000 cells per cm. and lancet shaped encapsulated gram-positive diplococci and only a trace of sugar.

Treatment. Owing to the seriousness of the general clinical picture, although there was but little upon which to base a diagnosis of mastoiditis, the right mastoid was opened at 10:00 a. m., December 4. There were a few granulations in the mastoid antrum and in the small pneumatic cells but no free pus and no evidence of necrotic bone.

Immediately following the operation the patient's general condition continued to go from bad to worse. At 6:00 p. m. on the day of the operation her temperature was 105.8 degrees and she complained of a great deal of pain over the forehead and occiput. When not vomiting she was drowsy, almost in a stupor.

The following morning, December 5, twenty-four hours after the operation, and forty-eight hours after the first symptoms of meningitis were noted, she was given 10 c.c. of autocerebrospinal fluid into the muscles of the right breast. At that time her temperature was 103 degrees and remained fairly high all that day. At 12:20 the following morning her temperature was 101.2°, at 10:00 a. m., it was 98.8°. On December 7 the patient said she felt fine and her temperature was still normal. The injection of cerebrospinal fluid was repeated. December 9, or four days after the first treatment, the cerebrospinal fluid appeared to be perfectly clear and the cell count was 15. Blood cultures were negative.

The treatment was continued on alternate days and the patient seemed to improve steadily until December 13, when her temperature registered 102.4 degrees, but she showed no other unfavorable symptoms and her temperature gradually became normal in three days. On December 19 she complained of headache, was cross and restless. The following day she was dizzy, photohobia was pronounced and her temperature gradually ran up to 102.6 degrees.

December 21, dizziness and photophobia were even more pronounced and she vomited repeatedly. There was no nystagmus and never any disturbance of hearing. Her temperature at 4:00 p. m. was 104°. The treatment was administered daily for four days, beginning with December 3. December 25, her temperature was normal but dizziness continued until December 27. Thereafter her temperature varied from 98° to 101° until January 24, when it rose to 102.8°.

During this time her general condition was as changeable as her temperature. Four or five quiescent days were invariably followed by one or more days of headache, dizziness, photophobia, nausea and vomiting and extreme irritability. On January 5 her condition appeared to be almost hopeless, but these relapses were invariably followed in a few days by improvement after the daily reinjections by cerebrospinal fluid. The leucocytes remained more or less constant at about 15,000 with 80 per cent polys, while the cells of the cerebrospinal fluid varied with the condition of the patient. At no time did the urine show anything more serious than a few granular casts and an occasional red blood cell.

Beginning with January 25, the treatment was supplemented by the daily administration of 25 cc. of pneumococcus antibody intramuscularly for six days. Henceforth recovery was uneventful. She left the hospital on February 11. She has since grown taller, gained in weight, returned to school, developed an acute cold followed by a mild attack of whooping-cough which subsided without complications, and she is now the picture of health. In addition to the treatment above outlined she received cod liver oil and optochin base orally.

Case No. 2. Referred by Dr. J. C. Lyman. She was also a blond girl, seven years old, fairly well developed but slightly undernourished. She entered the hospital March 7, 1930.

On February 25 she began to complain of pain in the left ear, over the left eye and left temple, but it did not seem to be of a serious nature. On March 1, the left eardrum was lanced but was followed by very scant discharge of rather thick pus which had to be removed with an applicator. Her earache was not relieved by the myringotomy and became severe during the following night. A day later her condition appeared to improve a great deal and she began to exhibit her usual signs of activity and interest in her surroundings, but, on the evening of March 6 the pain over the left eye and left temple returned in a greatly aggravated form and was continuous and progressive. On the morning of March 7 she was badly nauseated and vomited several times, and was cross and irritable, preferring not to be disturbed.

When admitted to the hospital on the evening of March 7, her physical examination revealed the condition described below. There was a slight purulent discharge from the left middle ear. The corresponding drum membrane and the upper posterior wall of the external auditory canal were red and swollen, but there was no tenderness or swelling of the tissues over the mastoids which appeared to be healthy. However, the roentgen report described all of the left mastoid cells as being more hazy and more blurred than they were when a similar examination was made three days previously. Her neck was stiff and her head was drawn backward, forming an arch of the neck and back, pronounced opisthotonos. She would cry when attempt was made to raise her head from the pillow.

Kernig's sign was present. The right knee jerk was normal, but the other deep and superficial reflexes were diminished. There was no Babinski or other disturbances of the plantar reflexes except a diminution in the excursions. She paid almost no attention to her surroundings or to those about her.

Clinical laboratory report. The cerebrospinal fluid was cloudy and contained large flocculi. The cell count was 1400 with 97 per cent polys. The sugar content was 37 mg. per 100 cc. Smears of the cerebrospinal fluid contained a small number of gram-postitve lancet-shaped diplococci which were tentatively called pneumococci. Later, however, their cultural and other characteristics proved them to be nonhemolytic streptococci.

Blood. The total leucoyte count was 27,500 with 30 per cent polys.

Urine. The urine contained a trace of albumin and diacetic acid and a few hyaline casts.

Treatment. The patient's condition was obviously critical. I was advised, after consultation, against surgery as needless torture for it was considered too late to hope to accomplish anything thereby. However, I insisted on a left side thorough simple mastoidectomy, to which her parents readily consented. The mastoid antrum was unusually small but contained pus and granulation tissue. Smears of the pus revealed the presence of a similar type of microorganisms to those found in the cerebrospinal fluid which also proved to be nonhemolytic streptococci.

The operation was performed at 6:30 p. m., on March 7, preceded by an intramuscular injection of 22 cc. of the patient's cerebrospinal fluid. These injections were repeated thereafter every twelve hours until the patient's appearance was normal and the intraspinal pressure remained reduced to what we considered a safe level. Believing that we were dealing with a pneumococcal infection the child was given also an intramuscular injection of 25 cc. of pneumococcus antibody twenty-four hours after the operation and repeated every twelve hours until six doses had been administered.

At the time of the administration of the first injection of cerebrospinal fluid her temperature was 103.8°, pulse 146, and respiration 28. At 6:00 o'clock the following morning her temperature was 101°, pulse 128, respiration 30 and her general condition correspondingly improved. On March 10, three days after the first treatment, her temperature became normal and remained practically so until she was dismissd from the hospital on April 3. The highest temperature recorded after it once became normal was 99.2°. In the meantime the patient was feeling fine and acting and reacting like a normal child, free from headache, dizziness, photophobia and other discomforts.

Course. This case ran a steadily progressive course with practically no oscillations whatever. The cell count of the cerebrospinal fluid which was originally 1400 was steadily reduced and was normal twelve days after the first treatment. On March 25 and 31 the cell count was 2 and the sugar content was 60 mg. per 100 cc., although there was still a trace of albumin present in the cerebrospinal fluid.

Since she was dismissed from the hospital on April 3, she has gained in weight, is bright, active and alert, enjoying perfect health. She has had no headache or other symptoms of nervous disease or mental disorder.

## GENERAL COMMENT

In every instance, in both cases, the cerebrospinal fluid when injected into the muscles was absorbed with unusual rapidity and without the slightest local reaction, and there was never once the merest suggestion of shock or other harmful systemic effects.

"One swallow does not make a summer," neither do two cases warrant sweeping deductions but, considering Spanyi's results and Mariotti's observations and Lauzer's experience with the method, the rapidity with which the symptoms disappeared in the second case, to whom the treatment was administered in large doses at twelve hour intervals, and the simplicity and apparent harmlessness of the procedure, it is my firm conviction that the method merits the most careful clinical consideration and thorough experimental investigation. My experience with these two cases has caused to develop in me a semblance of security, for one could hardly observe them throughout the daily course of the disease without feeling a little more optimistic regarding the prognosis of this most deadly malady.

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## DISCUSSION

Dr. Edward S. Lauzer, Rock Springs, Wyo. "All things in science begin with uncertainty, and end in facts." I wish to congratulate Dr. Rooks on his paper and also wish to express thanks to him for his courage in using this new and radical treatment of meningitis.

My interest in autotherapy and experiments began in 1912, when we first used immune serum in the treatment of scarlet fever. I obtained very favorable results and proceeded to do some investigating, finding that by withdrawing ascitic fluid and reinjecting it into voluntary muscle tissue we could produce polyuria, then later attempted and succeeded in extracting certain types of carcinoma and reinjecting the extract again into voluntary muscle tissue, and affecting a rapid recovery.

Following an epidemic of influenza, in which a great many patients suffered from secondary anemia, we again turned to autotherapy, and found that by withdrawing 5 cc. of blood from a vein and immediately reinjecting it into voluntary muscle tissue, a peculiar phenomenon would result. The first twelve to twenty-four hours after the injection there would be a slight drop in the red cell count, the hemoglobin would also drop and the coagulation time lengthened, this, we have designated the *negative phase.*

Following this phase, a rapid rise in the red cell count occurs and a rise in the hemoglobin content and the coagulation time returns to normal. The peak of this *positive phase* is reached in thirty-six hours after the autohemic injection. The white cell count, if increased as it usually is, drops down to normal. An increase in red cell count has repeatedly been noted as high as one million at the end of thirty-six hours.

We have been treating Rocky Mountain spotted fever by autohemic injection for the past five years with wonderful results, so that now it has become a standard treatment with us. In the early part of 1929, during an epidemic of cerebrospinal meningitis, when the results from serum could not be obtained, we resorted to the use of autotherapy, and found that results could be obtained by reinjecting cerebrospinal fluid into voluntary muscle tissue, the details of which are given in an article published in the *Medical Sentinel.*

Dr. Rooks has followed our line of treatment, but in a different type of meningitis, and has brought out the fact which must in all cases such as he described in his paper be followed. That is, that if there is a local point of infection, such as a mastoid, free drainage must be established. From what work has been done in autotherapy, the fact has been clearly demonstrated that a great field has been opened, and that as we learn more about it, we shall become convinced that greater stress should be placed on biology in the medical college.

We are not able to state as to how or why these results are obtained, but we are convinced of the fact that bacteria act differently when injected into tissue other than those of their selection, within the same body. It would seem that nature has stored the protective mechanism in all animal life in the outside covering of the body, but chiefly in the voluntary muscle fibers.

# TRAINING THE CHILD TO EAT*

CHARLES E. HUNT, A.B., M.D.
EUGENE, ORE.

(Concluded)

One common cause of anorexia in the young is prolongation of the period of bottle feeding. The bottle should be confined to infancy and the child weaned by nine to ten months to spoon and cup feeding. If cereal, orange juice, vegetable, etc., has been started from six months up, there is no difficulty in accomplishing this.

Prolongation of milk feeding in older children is a very common cause of loss of appetite. These children are often taking a quart of milk a day and more. Milk is of the most importance in infancy but there comes a time later when it is not of the most importance and has to be reduced very materially and other solid food substituted. Milk is lacking in vitamins, minerals and other elements, and is not a perfect food beyond infancy. The propaganda to give a quart a milk a day to growing children is pernicious from the standpoint of dietetics and is one of the chief causes of anorexia. Schultz, Porter and many others have emphasized this important point.

The foundation for loss of appetite is often laid when attempting to educate to a new food. This should be done in a matter of fact way and without undue concern or the use of force. Feeding new substances is largely a matter of education, and patience and much tact must be used. It is here that the first fatal error is usually made. No notice should be made of refusal. Eventually the food will be eaten.

Another important factor is the use of toys, stories, etc. to divert the child's attention. Also artificial pacifiers, unkept promises, threats, etc. On this score many parents are guilty, and many children need new parents more than anything else. The parents of an only child are the worst offenders here. Children require supervision but not the kind which these children get.

With older children serious mistakes are made and anorexia developed when any eating is allowed between meals; milk is used as a beverage between meals, or too much food in too large quantities is offered at meal time with an anxiety shown or expressed as to the amount eaten. A pernicious habit, also, is to give children milk at bedtime.

Many children are thought by their solicitous parents to be suffering for loss of appetite, when, as a matter of fact, they are well nourished. The trouble is that they do not eat as much as the parent thinks they should. Too short intervals between meals is often a cause. For the child a year old and over, three meals a day are sufficient and on this regime with no lunching between there will be a good appetite, providing the child is not ill. Talking about food and eating habits in the child's presence at any time is pernicious. The child that thinks he is a bad eater very often will do his best to live up to the reputation.

Schultz maintains that chronic anorexia in childhood is seldom encountered in the rugged child. He holds that it occurs in the hyposthenic or asthenic type, and is probably a constitutional disposition or characteristic, transmitted from parent to offspring. He states that it occurs with hyperfunction, hyperactivity, great instability of temperment, a tendency to habit formation, wilfulness and behavior problems. They are often the offspring of intellectuals. He says, "After the most critical survey and evaluation of all causes, both principal and contributory in a case of functional anorexia, one will be forced to the conclusion that underlying the whole complex picture is the constitutional disposition." Wile of New York very strenuously objects to Schultz' consideration of the relationship of anorexia to heredity and states that the relation between them is not more important than that of typhoid and other conditions to heredity.

Porter considers that these behavior anomalies relative to eating can be prevented, and that the parents should be trained in prophylaxis. He says it is the glare of the limelight that brings these children to this state of maladjustment in almost every case. Sweet considers one of the important causes the fact that by not eating the child gets something which he values more than food, and that is the undivided attention of every adult member of the family. Greenwald emphasizes Krasnogorsky's work which shows that emotional states of all sorts, such as grief, anxiety, excitement, anger, etc., all put a stop to or grossly interfere with the psychic secretion of gastric juice, so that the sense of appetite is lost. Greenwald mentions factors which disturb the psychic well being and affect appetite as being coercion, coaxing, distracting the child's attention, imitation, negativism, prolonging the period of infancy, criticism of table manners, etc.

There is another type of child who does not eat because of overfatigue, overexcitement, too much play or too much competition with other and older children. They get up late and worry about getting off to school on time. They are anxious to get over a meal and get out to play or are too busy playing to come in and eat. They are overexcited in anticipation of going to a show or other entertainment and their appetite is affected accordingly. These children have to rest before a meal for a short time, and relax and rest a short time afterwards. They have to get to bed earlier, get more rest and cut down on all manner of excitement and strain. Occasionally they have to be taken out of school for a short period. Sometimes they need a change of scenes and environment.

Careful examination following a good history will show, however, that there are many physiologic and organic causes underlying loss of appetite, and that one must not overlook these causes, and consider all cases as due to errors in training and abnormal psychic makeup. It has been shown by Miles, Roth and Smith that incomplete diets, particularly those low in protein and high in carbohydrate can lead to anemia and loss of appetite. Many workers have shown that an abundance of vitamins in the diet favor blood formation and stimulate appetite. Minot and Murphy showed the remarkable results in blood regeneration by feeding liver, kidney and beefsteak. They state, "frequently the appetite, which had previously been very poor, became ravenous." The sum total of all of these recent experiments shows that liver diet acts as a stimulant to regeneration of blood and this in turn to an increase of appetite. In the absence of other organic disease, anorexia of long standing is frequently found associated with a mild secondary anemia. The improvement in appetite following liver diet is striking in these cases.

Metabolic processes may be unstable in these children. Such disorders as acidosis and cyclic vomiting are often encountered. The vasomotor system may be unstable, as also the nervous system. Cameron raises the question whether the carbohydrate and fat metabolism are adequate, and believes that a tendency to transitory periodic ketosis is referable to such cases. Hammett showed greater variation in the nitrogen, urea, creatinine, uric acid, amino-acid and sugar content of the blood. Carlson has shown that the secretory and enzyme function may be abnormal.

Hurvitz, Sauer, and others have shown that gastric atony, resulting in delayed emptying time of the stomach and diminished secretory function, is the underlying dysfunction in the child suffering from primary chronic anorexia. The emptying time is sometimes delayed as much as two hours over that of the normal child. The free and combined HCl is greatly diminished in the child with anorexia.

McCollum has shown that vitamin B. stimulates appetite. Some cases of anorexia are doubtless due to lack of this vitamin. Moore's work on vitamin B. is of great interest as showing myelin degeneration of the vagus nerve. This may have a great bearing on digestion and appetite.

Griffith has pointed out that secondary anemia or a true chlorosis is more commonly present than diagnosed. The child shows marked improvement in blood pictures and appetite after the withdrawal of milk and substitution of green vegetables, etc. Some investigators have shown that a distaste for a certain food may be due to a true hypersensitiveness to it, and may be the child's only protection against a food injury.

The organic causes of anorexia I have left to the last because they are the most definite, although not the most common causes, and with a good examination will not ordinarily be overlooked. Bartlett showed in a large series of cases that the common organic causes of anorexia in children in the order of their occurrence or prevalence were septic tonsils and adenoids, acute infections of various kinds, tuberculosis, pyelitis and dental caries. Abt mentions, in addition to these, diseases of the heart and kidneys, and vitaminosis. He states that there is not a single cause but various and widely differing causes.

Schultz says that focal infections located about the head are far the major causes of organic anorexia in children. Many workers have shown a low grade secondary anemia present, but it is difficult to say in this case which is cause and which is effect. Mention should be made of the common cold which is one of the most frequent causes of temporary loss of appetite. In fact, loss of appetite is usually the first symptom of this malady. In acute or chronic gastrointestinal indigestion and in diseases of the mouth anorexia will be present. Acute pain anywhere in the body will take away appetite.

Estimation of the physical condition underlying anorexia may only be completely done during a period of observation. Low grade fever may elude detection. Infection in infants may be present without fever and yet be a cause of anorexia. Urinalysis and tuberculin tests should be done and in some cases the gastrointestinal tract roentgenrayed.

In regard to treatment much has already been said. Prophylaxis is more important than cure, and if some of these points already mentioned are taken into account, there will be far less anorexia to treat. In a condition depending on so many causes the treatment will be varied and will depend upon the underlying etiology. The treatment in nurslings will consist of correcting the food and feeding habits. The food may have to be reduced, and the intervals between feedings lengthened. Some particular article of diet may have to be removed, or cream may have to be removed from the milk.

The keynote of treatment at this age is to reduce the amount of food. In some cases a short preliminary period of starvation is necessary or the milk diluted one-half. It is often best to offer less food at a feeding than the baby wants. As soon as signs of appetite begin to return, the amount is gradually increased, always keeping just behind the baby's wants and taking the bottle away before he pushes it away. If reduction of the amount of food does not succeed, search should be made for an obscure physical cause.

If the anorexia does not disappear with removal of this cause, a diagnosis of psychologic aversion will probably be correct and other means taken to correct this. We must remember that teething, beginning rickets or scurvy, lack of outdoor air and sun, etc., are causes of loss of appetite in infants. A more concentrated food, with less handling and excitement, is necessary in some cases. Some firmness must be used in dealing with an infant who is being educated to food.

In regard to the loss of appetite in older children, there are so many causes, as already mentioned, that the treatment will be varied. A careful history is of prime importance, followed by a painstaking and thorough examination. What happened when the anorexia first appeared? This answer will be of great help. The trouble may date back to the nursing or weaning period or to some acute illness. The child may be neurotic and living in a neurotic environment. The training may have been very faulty.

The whole regimen of the child must be arranged properly. Outdoor life, exercise, sleep, proper handling, etc. are necessary. The feeding habits must be corrected and the food proper in amount, kind and in serving. The overtired child should have more rest, especially before meals and after. The diet should be reduced at once and no force used in feeding. All nagging, remarking about food, etc. should cease. Nothing should be given between meals but water, and at meal time the child should spend only a moderate time at the table with proper food set before him and no comments made whether he eats or not. With nothing given until the next meal, appetite will soon return, unless there is organic disease at the root of the situation.

The reduction of milk, or in some cases its entire removal may be necessary. Children who drink large quantities of milk will not eat other food and it must be completely withdrawn for a time at least. Probably one pint a day is enough for any older child. Fried and greasy foods should be eliminated from the diet and plenty of fresh fruits and vegetables added. The diet should contain an abundance of vitamins. Meat extractives, especially beef, liver and kidney, stimulate appetite and are important. Constipation should be corrected.

As to psychologic factors, routine treatment can not be prescribed. It is important, however, for everyone connected with the child to temporarily forget the subject of food intake and gain in weight. A psychologic cure can not be made in a day. The parents must first be educated. Appetites must be reeducated into these children. Every person having anything to do with the child should be properly instructed. The job should be turned over to one individual of the right kind who can properly deal with the child. In extreme cases the environment should be entirely changed and the child sent away from home. The association with other children who eat properly is of great importance. The excitable, active child who is in a hurry to get to school, in a hurry to get home, in a hurry to get out to play, who often becomes overtired and who tries to keep up with older children, must be taken in hand and more rest, quiet and a more orderly, serene life obtained.

There is so much to be said on this great subject of anorexia as to causes, treatment, prevention, etc. that one could go on at great length in discussion. However, in closing I will say that the condition is complex and often difficult of solution. The treatment is often no simple matter. Not only is a knowledge of the child's make-up necessary, but a great deal of patience must be exercised as well at times.

First, the child's feeding habits must not be discussed, certainly not in his presence. Second, the mother or nurse should be made to understand that the child will not die of starvation, even if he misses a few meals. The child should be offered a well balanced normal diet and no important article eliminated because he does not like it. Three meals a day should be offered and absolutely nothing allowed between meals but water.

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# EDITORIAL

## MEDICAL HISTORY OF THE PACIFIC NORTHWEST

For several years, among those interested in the attempt to produce a history of medicine and of practitioners in our Northwest section, the matter has often been discussed as to the feasibility and the method of accomplishing such an enterprise. During the territorial period and the early days of statehood in Oregon, Washington and Idaho, there were notable members of the medical profession who took an active part in guiding the destinies of these young commonwealths. Not only in medical matters were they prominent figures, but in civic, commercial and religious circles they left their imprint on the progress of those years. It is the opinion of many physicians who have paid attention to the matter that it would a profitable and worthy project to assemble facts concerning the lives of these pioneer practitioners and the activities in which they were concerned, as well as the events of subsequent days, and publish them in a volume which would present a permanent record of the progress of medicine in the days gone by.

Various suggestions have been presented for the attainment of such a purpose. It is agreed and is apparent to anyone that a single individual would have great difficulty in assembling the necessary data which are indispensible for the projection of such a work. If, however, it could be distributed among men in the different states who would exercise sufficient interest to accumulate the necessary material, a publication might be successfully produced. The suggestion for this purpose is that each of the three state organizations at its next annual meeting appoint an historical committee, whose purpose shall be the accumulation of material for such a history. This committee in turn should be authorized to select committees from the different county societies, whose members would assemble the available data which could be most successfully obtained by those nearest to the location of the men and facts under consideration. In certain sections some such material is already available. Thus a history of King county was published about a year ago, in which is included a chapter dealing with medical affairs, which recites certain events occurring in the early history of the county with sketches of the lives of the earlier physicians. Similar publications may have been produced in other counties of these states. At the present time older physicians are practicing in the different cities, whose memories run back to some of the early medical incidents of their localities and who were acquainted with distinguished pioneer physicians. If such a medical history were to be considered, advantage should be taken of the knowledge of these older practitioners. It should be noted that many of these men have passed on within recent time and that their number is gradually diminishing. With their assistance, however, a work of this sort could be much more easily accomplished.

One of the most serious problems of such an enterprise would be its financing. This could be accomplished by two methods. Some individuals might be found who would be sufficiently interested to contribute sums of money sufficient to guarantee a certain portion of the expense. Otherwise it would be necessary to depend upon subscriptions. One could scarcely expect a sufficient sum from this source to warrant the publication of such a volume in one state alone. The suggestion of covering the three states in one volume is due in part to the probability of securing a sufficient number of subscriptions from interested physicians in this larger territory to insure the financial success of such an endeavor. The purpose of this writing is to excite an interest in this project among the physicians of our three northwestern states. If the reaction is sufficient to show a real interest in such an undertaking, it might be carried out according to the plans above presented. It is hoped that, during the period before the next annual meetings of our state associations, there may be sufficient discussion of this subject to determine some action toward initiation of efforts in this direction.

## AN APPROVED CONTRACT PRACTICE

Much has been said and written on the objections to contract practice which is condemned by some in all its forms. Few words of approval have been expressed. In view of this situation one will read with interest the survey of the Endicott Johnson workers' medical service, recently published by the Committee on the Cost of Medical Care. This company operates factories for the man-

THOMAS E. GRIFFITH, The Dalles, Ore.
President, Oregon State Medical Society, 1931

ARVID E. ANDERSON, Aberdeen, Wash.
President, Washington State Medical Association, 1931

DELOS E. CORNWALL, St. Maries, Ida.
President, Idaho State Medical Association, 1931

ufacture of shoes in Binghamton, N. Y., as well as four adjacent towns. They employ about 15,000 workers, who with their families number over 40,000, cared for by contract. The medical service includes three medical centers beside first aid stations and clinics in other localities. More than $800,000 is expended annually for the medical service. A full-time staff of more than one hundred physicians is employed, consisting of twenty-eight physicians, beside dentists, pharmacists, bacteriologists, technicians of various sorts and clerks. The physicians include internists, surgeons and specialists in various lines.

The published survey of this work, covering 1928, presents comments of several investigators. One observer states that the actual treatment of disease by this service is favorably compared with that of practice in any small city, while in preventive medicine and obstetrics it is superior. Another comments that the general organization of the hospitals and clinics is above the level usually found in nonteaching institutions of this size. Contract practice is traditionally alleged to be on a distinctly lower plane than in private practice. In this case such judgment apparently does not hold. These observers comment that the relations of these contract physicians to the patients is a personal one similar to that found in good private practice. Compared with the practice of private physicians, it was noted that in seventy-six per cent of illnesses among the Endicott Johnson workers the physician was called within three days after the onset as compared with sixty-eight per cent among private practitioners. As to ultimate results there seemed to be no appreciable difference. There appeared no significant difference among the two types of physicians as regards education, internship and postgraduate study. During the year in question about $200,000 was expended for services of physicians, making $5.69 per annum as a per capita cost for services among the families under treatment.

So far as the physicians themselves are concerned, a most vital question is that of personal income. The comparison was made between the twenty-six Endicott Johnson physicians and fifty-one outside physicians during 1927. Among the contract practitioners none received less than $3,000 and none more than $12,000 annually, nearly half ranging from $3000 to $5000 with nearly as many reaching seven thousand. Among the outside physicians the income of five was less than $3,000, while five received more than $12,000, with a maximum of $35,000. Here also the largest number of incomes were from $3,000 to $5,000. The Endicott Johnson men also receive certain valuable perquisites, such as sick benefits, participation in investment savings, old age pensions and an allowance per annum of nine hundred dollars for operation of motor cars.

The relations of these practitioners with local physicians were harmonious, most of them belonging to the county medical society and a goodly proportion to local specialists' societies. It is commented that the existence of such a medical service presents a noteworthy economic and social phenomenon. During the ten years of its existence there has been evidence of confidence and goodwill among the professional and technical staff, the patients, the general medical profession and the financial sponsors. The successful operation of this medical service among this large group of workers is a demonstration of a possibility of conducting an elaborate health service which may be of benefit to an extensive community. Whether such a plan might be adaptable for general execution would depend upon a great variety of conditions in different communities. This successful exhibition of acceptable contract practice on a large scale is presented at this time for the attention of those interested in this perplexing and much debated subject of contract practice. The report, from which the above brief notes have been taken, is commended for further study as offering much food for thought.

## BASIC SCIENCE LAW UPHELD

The legislatures of several states have passed basic science laws which have been in operation for a number of years. In other states such measures are under consideration and probably will soon be enacted into laws. There has been a question in different parts of the country whether such a law is constitutional and its opponents have been outspoken in their confidence in this position. Therefore, it is of interest to note that the Supreme Court of Minnesota has passed on the validity of the basic science legislation in that state. The law was attacked on numerous occasions in the District Court, not only as to its validity but as to the right of the Basic Science Board to issue basic science certificates to those who were licensed to practice medicine at the time the law was enacted in 1927. The court held that the law was not violative of any of the provisions of the state or federal constitutions and that the Basic Science Board could lawfully issue basic science certificates without examination to those who were licensed at the time the law went into effect. The court was unanimous in writing this opinion. While the provisions of the Minnesota law probably differ somewhat from those in other states, as in Washington for instance, the fact that the Supreme Court of that state has upheld its validity is a guarantee that similar laws existing or to be passed in other states will withstand attacks in other parts of the country.

## SALE OF CHRISTMAS SEALS

During recent years the organized antituberculosis work of this country has been influential in producing a notable decrease in mortality from tuberculosis. These results have been due to the labors of the state and county antituberculosis leagues which have been established in all the states. In the early days of this effort there was a constant struggle for existence in an effort to obtain funds for carrying on the work. This difficulty was solved by the introduction of the annual sale of Christmas seals, which the postoffice department has permitted to be attached to letters and packages carried by the mails. This enterprise of selling seals during the Christmas season is familiar to everyone. The purchase of great numbers of these at a penny each has appealed to the public to such an extent that the resulting revenue suffices to finance the work of this organization during the year. The seals are provided by the National Antituberculosis Association which distributes an adequate number to each state organization which in turn allots the necessary number to the cities and towns in its jurisdiction. Of the money received 5 per cent is assigned to the national organization, while the remainder is devoted to carrying on the efforts of the state organizations. This is a commendable form of service which appeals to everybody. The expense being distributed in small sums among so many people, the burden is light to the individual but the results are substantial for the organizations conducting this work. On page 22 of our advertising section is an advertisement calling attention to this annual sale of seals which is conducted previous to Christmas day. If physicians will endorse the purchase of seals among their patients and other friends, it will aid in the success of this most worthy effort.

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## AN APPRAISAL OF PUBLIC HEALTH ACTIVITIES IN PORTLAND

A booklet has been published by the University of Oregon Medical School, entitled "An appraisal of Public Health Activities in Portland, Oregon, for the Years 1928-1929." About a year ago a survey committee was appointed, representing various health and medical interests of Portland as well as social and commercial organizations, for the purpose of making a study of the present public health activities of this city in comparison with others of similar size and to bring the public health facilities of the city and county to the highest level. Statistics are presented covering all features of health activities of the city, county, schools and other allied interests. This work of survey and investigation was conducted by James Wallace, associate director of the American Public Health Association.

It was recommended that the city and county form a single county health unit under one active head, known as City and County Health Officer, with an advisory board representing urban and rural areas. Other details are included to carry out this purpose. It was also recommended that a board of health should be appointed by the mayor, consisting of the City Council and three or four other members, the majority of whom should be physicians. It is stated that provisions for public health activities of Portland are only approximately fifty per cent of the average for cities of its class and about one-fifth of what is required as sufficient to provide a reasonable, adequate health service. This volume can be obtained from the Medical School at a nominal charge of fifty cents.

# MEDICAL NOTES

## OREGON

Hospitals on the Approved List. At the annual meeting of the Hospital Standardization Conference of the American College of Surgeons in Philadelhpia, the following Oregon hospitals were approved according to the established requirements: Astoria, St. Mary's, fully approved; Columbia, conditioned; Corvallis General, conditioned; Eugene, Pacific Christian, fully approved; Marshfield, Wesley, conditioned; Medford, Sacred Heart, fully approved; Oregon City, Oregon City Hospital, fully approved; Pendleton, St. Anthony's, conditioned; Portland, Shriners' Hospital for Crippled Children, approved; United States Veterans', approved; Good Samaritan, approved; St. Vincent's, approved; Multnomah, approved; Emanuel Hospital, approved; Dr. Robert C. Coffey Clinic and Hospital, approved; Doernbecher Memorial Hospital for Children, approved, and Portland Sanitarium, approved. Salem, Salem General, fully approved.

Addition to Hospital. At Astoria work has started on a $250,000 building for the new St. Mary's hospital, which will be completed some time next year. According to plans this will be a four story structure with accommodations for about seventy patients. Accommodations also will be arranged for sisters, nurses and other employees.

Assistance Asked for Hospital. Directors of the Salem General hospital have desired a special tax to be levied for public support of that institution. Since this has been declared impossible, plans are being considered for the city to take charge and operate the hospital as a public institution either by action of the city council or by a vote of the people at an election for that uprpose.

Distinction for Well Known Nurse. At the Richmond Memorial Hospital in New York the nurses' home has adopted a novel plan for commemorating the services of distinguisheds nurses. Instead of numbering the rooms, each is identified with the name of a well known nurse. Miss Emily L. Loveridge, for forty years superintendent of Good Samaritan hospital at Portland, has been selected for this distinction and her name will appear in connection with one of the rooms.

The Cancer Clinic. It is reported that efforts are being made by interested laymen to establish in Portland a clinic for the administration of the Coffey-Humber treatment of cancer. It is stated that a fund of $100,000 is to be collected to carry on this clinic for five years. The president of the Chamber of Commerce is especially active in this enterprise. He says that one hundred eighty Oregonians are now in San Francisco taking this treatment. He thinks opportunity for its benefit should be offered at home.

Dr. C. C. Dauer of Lakewood, Ohio, has been appointed county health officer and physician at Salem by Dr. V. A. Douglas, county health officer. He began to serve November 1, thus filling the vacancy caused by the resignation of Dr. Edward L. Russell who is now engaged in similar work in California.

Visit from Distinguished Professor. Last month Dr. James B. Collip, professor of biochemistry at McGill University, visited several cities, including Portland and Seattle, where he addressed local medical societies on "The Placental Hormone." He described significant experimental work with this substance and its effect on ovulation. He explained that this work may reveal interesting developments along this line.

Dr. C. R. Matthis, who formerly practiced at Amity, has located at McMinnville, where he will be associated in practice with Dr. Joseph Manning.

Dr. B. A. Menance has located in Corvallis, where he will be a member of the health service at Oregon State College. He formerly practiced at Ann Arbor, Mich.

Dr. F. P. Adams, recently of Portland, has located at Dufur. Before practicing in Portland he was located at Hermiston and Wasco.

## WASHINGTON

Hospitals Approved by the American College of Surgeons. The following hospitals have been approved by the hospital standardization committee of the American College of Surgeons at a recent meeting at Philadelphia:

Aberdeen: Grays Harbor Hospital, 76 beds. American Lake: United States Veterans Hospital, 495 beds. Bellingham: St. Joseph's Hospital, 100 Beds; St. Luke's Hospital, 100 beds. Bremerton: United States Naval Hospital, 224 beds. College Place: Walla Walla Sanitarium and Hospital, 54 beds. Everett: General Hospital of Everett, 100 beds; Providence Hospital, 125 beds. Longview: Longview Memorial Hospital, 96 beds. Olympia: St. Peter's Hospital, 100 beds. Port Townsend: United States Marine Hospital, 100 beds. Seattle: Children's Orthopedic Hospital, 132 beds. Columbus, 211; Providence, 412; St. Luke's, 60; City Hospital, 117; Seattle General, 135; Swedish, 255; Virginia Mason, 180. Spokane: Deaconess Hospital, 205 beds; Sacred Heart Hospital, 330; St. Luke's Hospital, 203; Shriner's Hospital for Crippled Children, Mobile Unit, 25. Tacoma: Northern Pacific Beneficial Association Hospital, 116 beds; Pierce County Hospital, 172; St. Joseph's Hospital, 350; Tacoma General Hospital, 200. Vancouver: St. Joseph's Hospital, 125 beds. Walla Walla: St. Mary's Hospital, 100 beds; United States Veterans Hospital, 355; Walla Walla Valley General Hospital, 59. Yakima: St. Elizabeth's Hospital, 183 beds.

Large Addition to Hospital. The Puyallup Valley hospital at Puyallup has been enlarged by acquiring the Clark apartments adjacent to it. This is a brick building of two stories which will be connected with the hospital. It has been remodeled to be used both for nurses quarters and additional patients.

New School for Nurses. In connection with Providence hospital, Everett, conducted by the Sisters of Charity, a new school of nursing has been completed at the cost of $100,000. It is three stories high, equipped with all conveniences for a nurses' home together with class rooms and administrative offices.

Meeting of the Mental Hygiene Society. A conference was held at Bellingham last month under the auspices of Washington Society for Mental Hygiene, of which Dr. D. A. Nicholson of Seattle is president. Addresses were made by Dr. J. G. McKay, associate medical director of the Canadian Society for Mental Hygiene, and Father Robert G. Lucey of Long Beach, Calif.

Hospital Changes Management. The Snohomish General hospital has been renovated and numerous changes and improvements installed which will make it an up-to-date institution. Mrs. G. H. J. Symms has leased it and will be its manager.

New County Society Proposed. Several physicians from Omak, Brewster, Oroville and other cities recently held a meeting at Omak for the purpose of organizing the Okanogan County Medical Society.

Dr. Frederick Bentley of Seattle has returned from a four months visit to Europe. With Mrs. Bentley he motored through Germany, Switzerland and Italy. He reported courteous treatment and traveling without difficulty in all these countries. He devoted a little time to professional investigations, but not enough to mar the pleasure of the summer touring.

Dr. William Dietz, who for the past two years has served on the staff of the Northern hospital at Sedro Woolley, has located in Tacoma, where he will specialize in neurology and psychiatry.

Physician in Politics. Dr. W. L. Jackson of Mount Vernon has been selected by Skagit county Republican precinct committeemen as representative on the state Republican central committee.

Dr. Marion M. Kalez has located for practice in Spokane, in which city he was a former resident. After graduating from medical school he served as intern at Jefferson hospital, Philadelphia.

Dr. Ralph Dalton has located for practice at Spokane. He recently graduated from Washington University at St. Louis, following which he was intern at Barnes hospital in that city.

Dr. W. J. Stark of Spokane, who has practiced in that locality for the past ten years, has located in Colville, where he will be associated with Dr. W. H. Gray.

Dr. H. T. Rhodes of Everett has returned from a period of study abroad. He took special medical work at Bordeaux, France, also visiting Switzerland and Germany.

Dr. Robert Hauschel has located for practice at Bremerton, his birthplace. After graduating from Northwestern University Medical School he served as intern in a Seattle hospital.

Dr. Bryam Newson, recent graduate of Northwestern Medical School, Chicago, has located for practice in Seattle.

Dr. R. J. Alcorn, formerly of Sandpoint, Ida., and having spent six years as resident surgeon at the Chicagoff Mines hospital Alaska, has located for practice at Reardan.

## IDAHO

Hospitals Approved. At the recent hospitalization standardization conference of the American College of Surgeons at Philadelphia, the following Idaho hospitals were approved as meeting standardization requirements: Boise: St. Alphonsus hospital; St. Lukes hospital; United States Veterans' hospital. Idaho Falls: Idaho Falls Latter Day Saints' hospital. Lewiston: St. Josephs hospital. Nampa: Mercy hospital. Pocatello: Pocatello General hospital; St. Anthony Mercy hospital. Wallace: Providence hospital.

**Attacked by Patient.** Dr. F. C. Gibson of Potlatch was called one night last month to attend a patient. As he approached the bedside the patient plunged a knife into his abdomen. He was at once removed to a hospital and successfully operated on. The patient was subsequently declared insane and committed to the state hospital.

**New Hospital Established.** Dr. J. E. Otte of Grace has opened a private hospital, occupying the second floor of Hayes Building. This is said to be an addition to the needs of Gem Valley people.

**Dr. O. P. Hamilton** of Mountain Home, where he has practiced for a number of years, last month moved to Boise where he will be associated with Dr. J. S. Stewart.

**Wedding.** Dr. L. J. Anderson of Payette was married September 26 at Weiser to Miss Edith Archibald of that city.

## OBITUARIES

**Dr. Calvin S. White** of Portland, Ore., died September 24 of disease of the heart, aged 62 years. He was born in Philadelphia in 1868. He attended Franklin College and received his medical education at the University of Pennsylvania Medical School. When he came West he located in Tacoma for a time and later practiced at Gervais, Ore. He located in Portland in 1905. He was a prominent member of the medical profession, taking active interest in all of its affairs, serving in various official capacities. He was at one time president of the state board of health. During the World War he served at the hospital at Camp Lewis. He was one of the best known and respected physicians in the state. His forceful and pleasing personality made him many friends both among the medical profession and general public. His death is a distinct loss to the profession of this state.

**Dr. Frank Pierce Gardner** of Seattle, Wash., died September 29 from cerebral hemorrhage, aged 61 years. He was born in Salem, Penn., in 1869, and graduated from the Medical College of the University of Western Pennsylvania. After postgraduate work at the University of Pennsylvania he came to Seattle in 1900, where he has since practiced. During the World War he was commissioned captain in the medical corps of the army, later being advanced to the grades of major and lieutenant colonel. He acquired a large practice and had the affection and respect of the people of his city.

**Dr. Frank A. Decker** of Reardan, Wash., was killed the night of October 2, when his automobile ran into a truck causing it to overturn on the highway. He suffered a fractured skull and a broken neck. He was 36 years of age, a native of Des Moines, Iowa. He received his medical education at University of Iowa, Iowa City. Coming West he practiced for a time at Cle Elum, locating at Reardan five years ago. During the World War he served overseas in the army medical corps with the commission of captain.

**Dr. John Patrick Sweeney** of Seattle, Wash., died of cerebral hemorrhage September 29, aged 73 years. He was born in Ireland and moved with his parents in his infancy to Rhode Island. He was a graduate of the College of Physicians and Surgeons, Columbia University, New York, in 1882. He lived for a while in Mexico and later was physician to the Colville Indian Agency of Washington. In 1888 he located for practice in Seattle. In the '90's he was active in local politics. He was a member of the board of aldermen, when the city council consisted of two chambers. At one time he was president of that body. He took an active interest in the county medical society, serving as its president in 1903. He was well known among a large circle especially among the pioneers of Seattle. He retired from practice several years ago on account of ill health.

**Dr. E. O. Finney** of Weiser, Ida., died suddenly at Chicago October 1, where he had gone for a visit, aged 51 years. He was born in 1879. He graduated from the University of Illinois Medical College in 1906. He had practiced for some years at Weiser where he was held in high esteem. Having been in poor health for some time he went East with friends, just before his fatal illness, to be gone for a few weeks.

**Dr. William Louis Gundlach** of Port Angeles, Wash., died September 3, aged 86 years. He was born in Germany in 1844 and graduated from Leipzig and Munich Universities. He came to the United States in 1864 and later graduated from Rush Medical College. He practiced at Lake Mills, Iowa, and then moved to Wells, Minn. He had a prominent part in business and civic affairs of this city, serving as its mayor. He later moved to Blaine, Wash., where he engaged in banking business. From thence he moved to California and located at Port Angeles fifteen years ago.

**Dr. A. H. Wheeler** of Creswell, Ore., died October 12, aged 76 years. He was born in Barton, Vt., in 1854. In early manhood he taught school, later studied medicine and graduated from the State University of Iowa College of Medicine in 1881. He was later dean of the school for seventeen years. Later he settled in Colorado, near Denver, where he was a clergyman as welll as physician. He has been a resident of Creswell for the past four years, practicing until a short time before his death.

**Dr. Ralph F. Goetter** died at Colville, Wash., from pneumonia October 5, aged 40 years. He was born in Colville in 1890, where he spent all his life except when he was studying medicine and serving in the World War. He received his B.A. degree at Santa Clara University in California, later studying at Gonzaga University. He studied medicine at Washington University, St. Louis, and received his medical degree at Marion Simms College of Medicine, St. Louis. After serving his internship at Michael Reese hospital, Chicago, he located for practice at Colville thirteen years ago. During the World War he served in the army medical corps as first lieutenant.

**Dr. Ernest Orion Finney** of Weiser, Idaho, died in Chicago September 30, aged 51 years. He was born in Rankin, Ill., in 1879. He obtained his medical education at the medical department of the University of Illinois, Chicago, graduating in 1906. After serving as intern at Augustina hospital he spent a year at Vienna. In 1909 he located for practice at Weiser. Last September he left for an eastern visit. Stopping at Chicago, he appeared to be in his usual health but on retiring he suddenly died that night. He was greatly beloved by the residents (of his city, having made a distinctive impression upon the whole community and surrounding sections by his personality, his professional acquirements and integrity in all his dealings.

Dr. Ernst Flehme of Spokane, Wash., died at Frankfurt-on-Main, Germany, October 18, aged 39 years. He was born in 1891 at Kiel, Germany. He received his medical education at the University of Kiel, where he graduated in 1914. During the World War he served as officer on a German war vessel. He was decorated with the Iron Cross for distinguished service. He came to the United States in 1924, studying in New York, Philadelphia and Chicago. He located in Spokane in the fall of that year as a dermatologist. He was considered proficient in this line of practice. On account of failing health he had returned to his German home, where he underwent an operation for tumor of the kidney which resulted in his death.

# REPORTS OF SOCIETY MEETINGS

## OREGON STATE MEDICAL SOCIETY

### MINUTES OF THE FIFTY-SIXTH ANNUAL MEETING OF OREGON STATE MEDICAL SOCIETY, HELD AT PORTLAND, ORE., SEPT. 17-19, 1930

### HOUSE OF DELEGATES

### First Session

*Thursday, September* 18

The opening session of the House of Delegates was called to order by President Wilson Johnston at 7:00 a. m. in the Grille Room of the Portland Hotel.

On roll call the following officers and councilors were present: Wilson Johnston, Frederick D. Stricker, J. Earl Else, E. L. Zimmerman, Thomas E. Griffith, R. H. Wellington, Joseph A. Pettit, William Kuykendall, C. L. Booth, Charles E. Sears, Frank R. Mount, E. A. Sommer, E. B. McDaniel, and the Executive Secretary.

The following delegates were present: N. L. Tartar of Corvallis, Central Willamette Medical Society; L. L. Truax of Klamath Falls, Klamath and Lake Medical Society; Irwin R. Fox and Leslie S. Kent of Eugene, Lane County Medical Society; H. J. Clements and F. K. Power of Salem, Polk-Yamhill-Marion Medical Society; William Lee Bishop, Frank E. Boyden, Homer P. Rush, Harry M. Hendershott, Blair Holcomb, Albert W. Holman, Charles R. McClure, John R. Montague, Eugene W. Rockey, E. W. St. Pierre, Goodrich C. Schauffler, B. A. Van Loan and A. M. Webster of Portland, Portland City and County Medical Society.

In the absence of the regular delegates, the following delegates were seated by vote of the House: W. T. Johnson of Corvallis, Benton County Medical Society; Charles E. Hunt of Eugene, Central Willamette Medical Society; A. M. Wade of Roseburg, Douglas County Medical Society; Lee B. Bouvy of La Grande and Thomas E. Griffith of the Dalles, Eastern Oregon District Medical Society; E. B. Pickel of Medford, Jackson County Medical Society; Walter E. Nichol of Hood River, Mid-Columbia Medical Society; W. K. Livingston, Karl H. Martzloff, Roy C. McDaniel, Robert C. Coffey, and Wayne J. Stater of Portland, Portland City and County Medical Society; C. T. Sweeney of Medford, Southern Oregon Medical Society.

Dr. A. G. Bettman of the Publications Committee and Clarence A. Smith, Editor of Northwest Medicine, were also present.

Upon motion duly made and seconded, it was voted to dispense with the reading of the minutes of the last meeting, they having been printed in the August, 1929, number of Northwest Medicine.

President Johnston announced the appointment of the following committees: Credentials, E. W. St. Pierre, Chairman, H. J. Clements, Charles T. Sweeney; Nominations, H. J. Clements, Chairman, R. H. Wellington, Lee B. Bouvy; New Business, J. Earl Else, Chairman, Charles E. Hunt, N. L. Tarter; Unfinished Business, Frank R. Mount, Chairman, William T. Johnson, Charles T. Sweeney; Resolutions, Lee B. Bouvy, Chairman, Eugene W. Rockey, E. L. Zimmerman.

President Johnston made some brief remarks regarding the activities of the Council during the past year.

### Report of the Secretary

Dr. Frederick D. Stricker, Secretary, made a verbal report of important actions of the Council of the Society and the Executive Committee of the Oregon Public Health League during the past year.

Upon motion duly made and seconded, it was voted that the report of the Secretary be accepted and the actions reported therein be approved.

### Report of the Executive Secretary

Clyde C. Foley, Executive Secretary, presented his annual report as follows:

To the Members of the House of Delegates of the Oregon State Medical Society: The following report of the Executive Secretary is respectfully submitted to the House of Delegates:

#### MEMBERSHIP

As indicated in the detailed report presented by Dr. Stricker, the enrolled membership of the Society at this time is 710 as compared with 612 reported at the last meeting. We have thus gained 207 members since 1926 and achieved the goal of over 700 members which was set when the present full time program was adopted in 1926. This gain of over 400 per cent during the past four years reflects the growing satisfaction of the physicians of the state with the progressive program of activities which will be briefly outlined in the following paragraphs.

#### ORGANIZATION WORK

The increase in the strength of our organization during the past year and the years immediately preceding has not been due to chance but to a well-planned program. The first step in this program was a survey of existing organization and membership in order to gain a comprehensive view of the problems with which we were confronted. For this purpose a card file was prepared, on which pertinent data concerning the professional standing, attitude toward organized medicine, and other vital information were recorded for every physician in the state. A survey was also made of the existing component societies with a view to ascertaining the extent to which the societies were organized to meet the needs of the medical profession in their communities. This general survey has been followed up by conferences with local society officers and talks with individual physicians to interest them in the program which the state medical society is trying to promote in its various component societies.

#### NEW TYPE OF LOCAL ORGANIZATION

The result of this survey indicated that it would be desirable to promote in the larger component societies a new type of local organization which could successfully combat some of the evil tendencies in the health field today, such as the domination of the public health educational field by lay organizations, the promiscuous giving of medical and dental service through uncontrolled free clinics, and the imposition practiced upon physicians and dentists by various commercial interests.

This new type of organization which we have designated as the "Oregon Plan" involves the following factors:

1. The ultimate coordination and cooperation of the following groups in each community:
    - a. Physicians.
    - b. Physicians' wives.
    - c. Dentists.
    - d. Dentists' wives.
    - e. Physicians' office assistants.
    - f. Dentists' office assistants.
    - g. Nurses.
    - h. Technicians.
    - i. Hospital executives and employees.
2. A Central headquarters preferably in a special professional building for physicians and dentists in a central downtown ground-floor location, in which the various activities of these cooperating groups are carried on.
3. The pursuit of a definite well-defined group of aims to ultimately embrace the following activities:
    - a. Scientific and social meetings.
    - b. A physicians', dentists' and hospital credit and collection bureau.
    - c. A physicians' and dentists' emergency telephone exchange.
    - d. A nurses' and technicians' registry.
    - e. A public relations bureau, the functions of which to include the maintenance of a public reading room, a public information bureau, a speakers' bureau for lay meetings, and the preparations of newspaper items concerning the activities of the medical society, and lay educational articles.
    - f. A reference library of scientific and technical books.
4. A personnel of competent lay employees trained in the ideals of the medical and dental profession and in the policies and aims of organized medicine working under the supervision of the state executive secretary.
5. The control of this cooperative organization and all formulation of policies and plans to be in the hands of the local medical and dental societies, acting through a joint committee of their members with whom the state executive secretary acting as manager is to be in close and frequent contact.

Three local medical societies, the Portland City and County Medical Society, The Lane County Medical Society, and the Polk-Yamhill-Marion Medical Society, have adopted this plan and placed it in effect. Other local societies have the plan under serious consideration at the present time.

The activities of the societies which are organized under the new plan have included a wide range, including among other things the carrying on of a periodic health examination week in which thousands of people were reached over the radio, through window displays, talks before service clubs, and the distribution of literature; the staging of educational exhibits at county fairs; and the preparation of "dead-beat" lists. Many people were also contacted through the lay reading rooms, some one thousand people for example having visited the Salem headquarters during the first five months of its existence for the purpose of securing accurate information on their personal health problems.

### IMPROVED RELATIONS WITH COMPONENT SOCIETIES

For some time it has been evident that the progress of organized medicine in Oregon would be accelerated to a marked degree by having the state headquarters office work in more close relation with the various component societies. During the past year steps were taken to bring this condition about. The President and Secretary of the state society made a personal visit to practically every component society which was followed so far as possible by a visit from the executive secretary. On these visits the local problems of the various societies were discussed and the state medical society's program outlined. During the summer also a conference of all component secretaries was held at state headquarters to carry out the same purposes. Practically all of the societies sent representatives to this conference and those in attendance were unanimous in the opinion that they carried away a much better understanding of the aims of organized medicine than they had had heretofore.

### BULLETIN

In order to further stimulate our organization work the headquarters office began the publication of a monthly bulletin to keep before the profession the economic and social aspects of medicine and furnish facts regarding the activities of the state society and its various component societies. This bulletin is mailed every month to every ethical physician in the state with the idea that, by placing our program before every physician who is eligible to membership, we can ultimately convert them into state medical society members. The bulletin is on a practically self-sustaining basis at the present time and will probably be entirely so with the publication of the third number in October.

The material in the bulletin is organized on a definite plan and excludes the presentation of scientific papers which will continue to be published in our journal, NORTHWEST MEDICINE. The material included in the bulletin is as follows:

1. A leading article on some economic or social aspect of medicine.
2. Business suggestions for the physician.
3. Medical-Legal notes.
4. State Board of Medical Examiners news.
5. University of Oregon Medical School library news.
6. Headquarters news.
7. Women's Auxiliary news.
8. A personal column.

The next issue will begin the inclusion of two new sections, devoted to the actions of the Council of the State Medical Society and the activities of the various component societies.

### OREGON MEDICAL BLUE BOOK

The necessary advertising to finance the second edition of the Oregon Medical Blue Book has been secured and the first work of compiling the biographic material has been completed. We expect to have sample pages of the new edition from the printer at this session. The Blue Book has been well received by the medical profession and the public and has gained recognition as the official handbook for ascertaining the professional standing of physicians in the state.

### GENERAL HEADQUARTERS ACTIVITIES

The headquarters office has answered a continually increasing demand for information from the public regarding physicians and health matters generally and has developed into the accepted "clearing house of medical information." Many thousand educational and antiquackery pamphlets have been distributed and a well organized program of window displays carried on. The executive secretary has had an increasing number of conferences with newspaper men, health workers, teachers and representatives of the allied professions of dentistry and nursing, as well as with physicians who have presented many professional problems for consideration and advice.

### IMPROVEMENTS AND FACILITIES

During the past year the headquarters office was rearranged to provide a council and committee room and a number of our regular monthly meetings have been held at luncheons served in this room. This plan has permitted the officers and committeemen to give more personal direction to the activities of the headquarters staff with resultant increased efficiency. We have also this year been able for the first time to care for practically all the activities in connection with our annual session in our own quarters and with the regular headquarters staff. This plan is likewise of marked value in bringing our members from all parts of the state into intimate contact with the newer activities of the state society.

### ACKNOWLEDGMENT TO OFFICERS

The Executive Secretary desires to make grateful acknowledgment for the kindly consideration received by him from the members of the society, the officers and committeemen, and the component society secretaries and presidents, as well as for the efficiency and loyalty displayed by the employees of the society whose activities he directs in representing the medical profession of the state.

Respectfully submitted,

CLYDE C. FOLEY.

Upon motion duly made and seconded, it was voted that the report of the Executive Secretary be accepted and placed on file.

### Report of the Treasurer

Dr. R. H. Wellington, Treasurer, made a verbal report of the finances of the Society as of June 30, 1930, based upon the report of P. W. Janney, certified public accountant. The certified report was as follows:

#### Balance Sheet as at June 30, 1930

#### ASSETS

| | | |
|---|---|---|
| Current: | | |
| Cash—General Fund | $3,288.50 | |
| Medical Defense Fund | 1,721.58 | |
| | | $ 5,010.08 |
| Accounts Receivable—Members | 7,248.00 | |
| Ore. State Med. Society to Defense Fund | 278.00 | |
| Eastern Oregon Society | 1.00 | |
| | | 7,527.00 |
| Accrued Interest Receivable | | 154.57 |
| | | $12,691.65 |
| Loan to A. M. A. Convention Campaign Com. | | 1,000.00 |
| Investments | | 15,717.95 |
| Due from Receivers—Ralph Schneeloch Co. | | 5,945.00 |
| Fixed: | | |
| Office Furniture and Fixtures | | 273.20 |
| Prepaid Rent | | 50.00 |
| | | $35,677.80 |

#### LIABILITIES

| | | |
|---|---|---|
| Current: | | |
| Vouchers Payable | | $ 1,588.12 |
| Unearned Dues | | 6,953.25 |
| Surplus: | | |
| General Fund | $ 9,752.39 | |
| Medical Defense Fund | 17,384.04 | |
| | | 27,136.43 |
| | | $35,677.80 |

#### STATEMENT OF INVESTMENTS

##### GENERAL FUND

| | | |
|---|---|---|
| City of Copenhagen 5's | $1,945.00 | |
| Interstate Public Service Co. 52 | 480.00 | |
| United States 4th Liberty Loan 4½'s | 1,016.30 | |
| | | $ 3,441.30 |

##### MEDICAL DEFENSE FUND

| | | |
|---|---|---|
| City of Copenhagen 5's | $ 972.50 | |
| Interstate Public Service Co. 5's | 480.00 | |
| Canadian National Ry. Co. 4½'s | 2,880.00 | |
| Government of Argentine Nation 6's | 3,018.75 | |
| Republic of Chile 6's | 1,876.50 | |
| United States 4th Liberty Loan 4½'s | 3,048.90 | |
| | | 12,276.65 |
| | | $15,717.95 |

#### STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS
#### JANUARY 1 TO JUNE 30, 1930

##### GENERAL FUND

| | | | |
|---|---|---|---|
| Balance on Hand January 1, 1930 | | | $1,465.01 |
| Receipts: | | | |
| Members Dues | | $6,658.50 | |
| Agency Collections: | | | |
| Portland City & Co. Soc. | $810.25 | | |
| Mid-Columbia | 14.00 | | |
| Eastern Oregon | 30.00 | | |
| Southern Oregon | 5.00 | | |
| | | 859.25 | |
| Interest | | 83.75 | |
| | | | 7,601.50 |
| Total Receipts | | | $9,066.51 |
| Disbursements: | | | |
| Salaries | | $ 300.00 | |
| Rent | | 300.00 | |
| Office Supplies | | 45.00 | |
| Telephone and Telegraph | | 6.00 | |
| Printing | | 45.50 | |
| Postage | | 139.56 | |
| Northwest Medicine | | 643.00 | |
| Annual Meeting | | 2.50 | |
| Medical Defense Fund | | 793.50 | |
| Miscellaneous | | 118.25 | |
| Oregon Public Health League | | 2,585.25 | |
| Portland City & Co. Soc. | | 756.50 | |
| Mid-Columbia Society | | 12.00 | |
| Eastern Oregon Society | | 25.00 | |
| Southern Oregon Society | | 5.00 | |
| | | | 5,788.01 |
| Balance on hand June 30, 1930 | | | $3,288.50 |

##### MEDICAL DEFENSE FUND

| | | |
|---|---|---|
| Balance January 1, 1930 | | $ 942.80 |
| Receipts: | | |
| Oregon State Medical Society | $992.75 | |
| Less May and June, Received in July | 278.00 | |
| | $714.75 | |
| Interest on Investments | 318.75 | |
| | | 1,033.50 |
| | | $1,976.38 |
| Disbursements: | | |
| Legal Services | $250.00 | |
| Telephone | 4.80 | |
| | | 254.80 |
| Balance on hand, June 30, 1930 | | $1,721.58 |

Upon motion duly made and seconded, it was voted that the report of the Treasurer be accepted and placed on file.

Dr. E. A. Sommer made a verbal report of receipts and expenditures from the A. M. A. Entertainment Fund. He stated that the sums advanced by the Portland City and County Society and the Oregon State Medical Society had been returned to the respective societies and that $7,000.00 of the contributions made by prominent Portland lay people for the entertainment of the A. M. A. convention had been donated to the University of Oregon Medical School Library. He reported a remaining balance of approximately $300.00 in the fund.

Upon motion duly made and seconded, it was voted to donate the balance of this fund to the Portland Public Library for the purchase of books on nursing.

Dr. Joseph A. Pettit offered an expression of appreciation on behalf of the Society for Dr. Sommer's work in connection with the A. M. A. convention which was unanimously adopted.

Dr. Stricker made a verbal report for the Committee on Scientific Work, which, upon motion duly made and seconded, it was voted to accept.

Dr. Stricker recommended that the by-laws be amended to provide for local committees on Clinics and Scientific Exhibits in order to relieve the State Society Committee on Scientific Work of the burden of handling these activities at annual sessions.

Dr. Irvin R. Fox, of Eugene, presented communications from the Lane County Medical Society, the Eugene Chamber of Commerce, and the mayor of Eugene inviting the State Medical Society to hold the 1931 sessions in Eugene. The communications were referred to the Committee on New Business.

### Resolutions

Dr. A. M. Webster presented the following resolution from the Council of the Portland City and County Medical Society relating to Industrial Practice:

That the delegates from our Society to the coming meeting of the State Society in September be instructed to present to the House of Delegates a resolution covering the following points and to actively support this resolution:

First. That the Oregon State Medical Society favors the revision of the fee bill of the State Industrial Accident Commission to conform as closely as possible to the fee bills of the several county and district societies.

Second. That we object to the arbitrary methods of the claim agent of the Commission.

Third. That we favor the appointment of a Liaison Committee, whose duties shall be as follows:

A. To act as an intermediary between individual doctors and the Commission and take up grievances.
B. To study the workings of the Workmen's Compensation Law in relation to the medical profession.
C. To study the relation of the activities of the Commission in Physiotherapy to the medical profession.
D. To investigate reported cases of favoritism in steering cases to favored doctors.
E. To consider price-cutting and underbidding.
F. To study and consider modifications of the law and to make recommendations to the proper authorities to secure improvements in conditions.

Fourth. That the Oregon State Medical Society invites the cooperation of the workers through their properly constituted committees to the end that the injured may receive best possible service and the attending physician an adequate fee.

Fifth. That the attending physician and not the State Industrial Accident Commission should be the judge as to the amount and character of service that should be rendered, and if the Commission disagrees with the physician, the difference should be settled by the Liaison Committee, the burden of proof being placed upon the Commission.

Sixth. That the Oregon State Medical Society favors the revision of the law to the effect (a) that one of the three appointees should be a physician appointed from a list of three nominated and recommended by the Council of the Oregon State Medical Society; (b) that rebates to employers should be abolished; (c) that the premiums charged should be made adequate to secure sufficient income to enable the Commission to pay physicians the increased fees.

Upon motion duly made and seconded, it was voted to refer this resolution to the Committee on State Industrial Affairs.

Dr. J. Earl Else presented the following resolution from the Council of the Portland City and County Medical Society relating to statewide representation on the Council:

Whereas, it has come to our attention that some of the other component societies of the Oregon State Medical Society have voiced the criticism that they do not have sufficient contact with the state society through adequate representation on its council; and

Whereas, many of these component medical societies have no representation whatever on the state society council; and

Whereas, the councilor-district plan as used by state medical societies throughout the country is designed to give representation to the medical profession in every part of the state through their own local members; and

Whereas, according to the district plan in effect in our state society Multnomah County is entitled to only two of the nine councilors; and

Whereas, at the present time six of the nine councilors are members of the Portland City and County Medical Society; and

Whereas, it is the desire of the Portland City and County Medical Society that it do not have more than its due representation on the state society council; therefore, be it

Resolved, that the Council of the Portland City and County Medical Society go on record as favoring the nomination and election of councilors of the state medical society in accordance with the spirit of the district plan now in effect and that in all cases local members be selected to represent the districts as designated in the existing district plan.

This resolution was referred to the Committee on Revision of Constitution and By-Laws.

Dr. E. W. St. Pierre presented the following resolutions from the council of the Portland City and County Medical Society, calling for amendments to the by-laws abolishing the Oregon Public Health League and providing for the delegation of the functions of the Oregon Public Health League to the Committee on Public Policy of the Oregon State Medical Society:

The Council has voted unanimously to instruct the Portland delegation to present and support the amendments to the By-Laws of the Oregon State Medical Society necessary to abolish the Oregon Public Health League and provide a permanent committee on Public Policy of the Oregon State Medical Society to care for the public relations functions heretofore exercised independently by the Oregon Public Health League.

1. By striking out all of Chapter XIII which provides for the financial support of the Oregon Public Health League by the Oregon State Medical Society as follows:

Section 1. The proper officers of this Society are hereby authorized and directed to remit as rapidly as available to the duly elected Treasurer of the Oregon Public Health League, who shall be properly bonded, a sum of money not to exceed ten dollars per active member per year; but in no instance shall a sum be remitted greater than fifty per cent of the amount received from each active member during the year.

Section 2. In consideration of the sum or sums of money set aside for the Oregon Public Health League as provided for in Section 1, of the Chapter, the Executive Secretary of the League shall be required to perform the work of an executive secretary of the Oregon State Medical Society under the direction of the Council of this Society.

2. By renumbering Chapter XIV to make it Chapter XIII.

3. By amending Section 8 of Chapter XII to read as follows:

The Council may employ a lay executive secretary, an attorney, and such other persons as may be necessary to carry on the affairs of the Society properly. The Council shall fix the compensation of the executive secretary, attorney, and all other employees.

4. By amending Section 1 of Chapter VIII by inserting after the word, "publications," the words "and public policy."

5. By amending Section 3 of Chapter VIII to read as follows:

The Committee on Public Policy shall consist of five members, each of whom shall serve for a term of five years. One member of this committee shall be elected annually by the House of Delegates, provided that at the annual session at which this amendment is adopted, one member shall be elected for five years, one for four years, one for three years, one for two years, and one for one year. The President and President-elect shall be ex-officio members of this committee.

Upon motion duly made and seconded, it was voted to refer this resolution to the Committee on Revision of Constitution and By-Laws.

President Johnston announced that it was now 9 o'clock and that it would be desirable for the House to adjourn. Upon motion duly made and seconded it was voted to adjourn until 6 p. m.

### Second Session

*Thursday, September* 18

A special evening session of the House of Delegates was called to order by President Wilson Johnston at 6:00 P. M. in the Grille Room of the Portland Hotel.

The following officers and councilors were present: Wilson Johnston, Frederick D. Stricker, Joseph A. Pettit, E. A. Sommer, R. H. Wellington, W. B. Morse, E. B. McDaniel, E. L. Zimmerman, Frank R. Mount, J. Earl Else, C. L. Booth, Thomas E. Griffith, William Kuykendall and the Executive Secretary.

The following delegates were present: Wayne J. Stater, L. L. Truax, J. F. Hosch, A. M. Webster, Leslie S. Kent, Charles E. Hunt, B. A. Van Loan, F. K. Power, C. C. Moore, R. C. McDaniel, R. J. Pilkington, H. J. Clements, N. L. Tartar, Walter E. Nichol, W. K. Livingston, Robert C. Coffey, Irvin R. Fox, C. T. Sweeney, E. B. Pickel, Albert W. Holman, Charles R. McClure, Lee B. Bouvy, E. W. St. Pierre, Karl H. Martzloff, A. M. Wade, Blair Holcomb, Homer P. Rush, John R. Montague, Goodrich C. Schauffler and William T. Johnson.

The following committee men were also present: J. F. Dickson, H. M. Greene, A. G. Bettman and H. H. Foskett.

### Report of Committee on Public Policy

The executive secretary read the following report:

Owing to the fact that the past year has not been a legislative year, the activity of this committee has been largely confined to the consideration of future plans. In the primary election, however, the committee reviewed the records of the candidates for the coming legislature and sent out a bulletin of information to assist physicians in selecting candidates, whose attitude was known to be favorable to public health and scientific medicine. Several candidates who have been inimical in the past were defeated at the election and we have the good fortune to report the nomination of three physicians, all of whom will probably be elected in November. This is the best representation of the medical profession in the legislature for many years.

A great deal of consideration was also given during the past year to the possibility of securing the enactment of a Basic Science law by the means of the initiative but, after consultation with several leaders in the legislature, the committee decided that it would be unwise to attempt to secure such legislation until the newspapers and general public are more aware of the necessity of a Basic Science act as a protection against incompetent practitioners and until there is greater unanimity of opinion on this question among the medical profession.

As a result of this decision, no extensive program of a positive character is contemplated at the coming session of the legislature. A special committee is working on proposed legislation to bring hospitals and clinical laboratories under the supervision of the State Board of Health and it is likely that legislation for this purpose will be presented. It is expected, however, that we will be confronted with a defensive fight against certain "cult legislation." The chiropractors and naturopaths appear to be making a concerted attempt to increase the scope of the therapeutic measures which they may legally use, particularly in the field of obstetrics. It also appears that the cults are fighting more vigorously than ever to secure admission to the staffs of public hospitals. The defeat of this legislation will require the organized cooperation of the component medical societies. We recommend that the officers of all component societies immediately take up with their members the question of appointing an active legislative committee which will contact the members of the legislature in their district and inform them as to proposed legislation. This contact should be maintained throughout the legislative session. Bulletins of information will be sent from the state medical society to the officers of all component societies regarding legislative matters and it is of the utmost importance that these reports be considered as promptly as possible and the necessary action taken.

Respectfully submitted,

E. B. McDaniel, *Chairman*,
John H. Fitzgibbon,
Noble Wiley Jones,
C. J. McCusker,
Thomas E. Griffith.

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

### Report of Committee on Education and Hospitals

Dr. Karl H. Martzloff, Chairman, presented the following report:

Your committee during the past year has done nothing further with the report made at the previous meeting of the state society, feeling that a year or two should elapse before again covering this ground with a view to ascertaining what changes have occurred in the matter of hospital interneship services.

Your committee met with the Committee on Hospital Legislation, of which Dr. Stricker is chairman. On this occasion a committee, consisting of Dr. N. E. Irvine of Lebanon and Dr. Warren C. Hunter, was appointed to devise a questionnaire designed to obtain information on the hospitals in the State of Oregon, on which proper legislation might be proposed. At the present time no further progress has been made.

Your committee feels the importance of a well planned program which will provide for continuity in the study of the hospital situation in this state over a period of several years. By the adherence to such a program the committees in spite of change in personnel will be able to take up the work where it has been dropped and carry the study to a logical conclusion.

We would suggest first that the hospitals in the State of Oregon be studied as to their organization, equipment, ownership, etc., from the standpoint of general, mental and nervous, tuberculosis, maternity, eye, ear, nose and throat, orthopedic, convalescent and rest, isolation, children's, skin and cancer and the hospital departments of institutions.

We would also suggest that wherever possible these hospitals conform to the minimum standard provided by the American College of Surgeons which we take the liberty of quoting:

1. That physicians and surgeons privileged to practice in the hospital be organized as a definite group or staff. Such organization has nothing to do with the question as to whether the hospital is "open" or "closed," nor need it affect the various existing types or staff organization. The word "staff" is here defined as the group of doctors who practice in the hospital inclusive of all groups such as the "regular staff," "the visiting staff," and the "associate staff."
2. That membership upon the staff be restricted to physicians and surgeons who are (a) full graduates of medicine in good standing and legally licensed to practice in their respective states or provinces, (b) competent in their respective fields and (c) worthy in character and in matters of professional ethics; that in this latter connection the practice of the division of fees, under any guise whatever, be prohibited.
3. That the staff initiate and, with the approval of the governing board at the hospital adopt rules, regulations and policies governing the professional work of the hospital; that these rules, regulations, and policies specifically provide:

   (a) That staff meetings be held at least once each month. (In large hospitals the departments may choose to meet separately.)

   (b) That the staff review and analyze at regular intervals their clinical experience in the various departments of the hospital, such as medicine, surgery, obstetrics, and the other specialties; the clinical records of patients, free and pay, to be the basis for such review and analysis.

4. That accurate and complete records be written for all patients and filed in an accessible manner in the hospital, a complete case record being one which includes identification data; complaint; personal and family history; history of present illness; physical examination; special examinations, such as consultations, clinical laboratory, x-ray and other examinations; provisional or working diagnosis; medical or surgical treatment; gross and microscopic, pathologic findings; progress notes; final diagnosis; condition on discharge; follow-up and, in case of death, autopsy findings.
5. That diagnostic and therapeutic facilities under competent supervision be available for the study, diagnosis, and treatment of patients, these to include at least (a) a clinical laboratory providing chemical, bacteriologic, serologic and pathologic services, (b) an x-ray department providing radiographic and fluroscopic services.

We would also suggest that in the case of small hospitals, where the minimum standard as provided by the American College of Surgeons cannot be met, that a plan be devised whereby these hospitals may, if they so desire, conform to a standard which will at least be acceptable to the Oregon State Medical Society.

We feel that a very sympathetic attitude should be adopted by the society toward the hospitals in our smaller communities in view of the fact that they are in most instances performing an indispensable service in spite of numerous serious handicaps.

In conclusion, we believe that some such plan will result in better hospitals which will render better service to both patient and physician and will at the same time anticipate the injection of meddlesome lay interference in communities, where hospital service is such as to lay itself open to possible criticism.

Respectfully submitted,
Karl H. Martzloff, *Chairman*,
Franklin P. Johnson,
Warren C. Hunt.

Upon motion duly made and seconded, it was voted that the foregoing report be accepted and placed on file.

### Resolution Commending the Executive Secretary

Dr. E. L. Zimmerman presented the following resolution commending the Executive Secretary for his efficient work:

Whereas, The Oregon State Medical Society has had the efficient services of Mr. Clyde C. Foley as Executive Secretary since May 1926, and

Whereas, Mr. Foley has injected his energetic personality into all the affairs of the Society, bringing it into a period of service to the profession at large, and an understanding relation with the public, and

Whereas, Mr. Foley has shown the profession that they have outside obligations to the public beyond the promulgation of scientific knowledge among its members, and

Whereas, Under his leadership the active executive personnel of the Society has grown from a single room with a half-time stenographer to the impressive organization which it now has, consisting of a suite of offices in one of the best Medical-Dental buildings in the Northwest, with nine full-time employees, a meeting place for local medical societies, a lay reading room and circulating library, a medical telephone service, a credit rating bureau and collecting service to the profession and many other activities, and

Whereas, Mr. Foley has organized similar bureaus in several other localities of the state and has won national recognition for the state in launching what is known as "The Oregon Plan" which has been inquired about from all parts of the United States, and

Whereas, He has also stimulated activities of the Society by arranging programs, furnishing speakers and caring for many details and arrangements of our scientific meetings, and

Whereas, Mr. Foley is equipped to an unusual degree by ability and training to represent the medical profession of the state before the newspapers and other public institutions with whom the profession is anxious to make favorable contacts, and

Whereas, His ability is recognized by active civic organizations, such as the Portland City Club, where he has served on many important committees, and

Whereas, He has made the State Medical Society a real "State" organization by actively participating in local medical affairs and aiding local medical societies to organize on a permanent basis, and

Whereas, He has been able to secure to an unusual degree the cooperation of the allied professions of dentistry and nursing in the development of joint professional program, and

Whereas, He has increased the membership of the State Society to 710, a gain of over 40 per cent since he took office in 1926, and

Whereas, He has vigorously attacked the economic and public educational problems of the medical profession and has been instrumental in establishing a permanent state headquarters and cooperative business and public educational bureaus for several component societies, and

Whereas, He has established "The Rod and Serpent," our monthly bulletin which received instant recognition as one of the outstanding publications of its kind in the country, and

Whereas, He has performed innumerable other important services to the State Society and the profession of the state, the mention of which would take a great deal of time, but which are well known to all those who are familiar with his work, therefore, be it

Resolved, That this Society express its sincere appreciation of his work and services and give him their fullest cooperation and assistance in carrying on the splendid work for the profession of this state which he has undertaken.

Respectfully submitted by,
Lane County Medical Society.

Upon motion duly made and seconded, it was voted that this resolution be unanimously adopted.

### Report of Committee on Auditing and Appropriations

The executive secretary read the following report:

Inasmuch as the Society now retains a certified public accountant to audit our books, the auditing function of this committee has been practically eliminated, except to review the report of the accountant. During the past year arrangements were made to have our accountant audit the books semi-annually and to present two financial reports as of June 30 and December 31.

Under the plan previously in effect financial statements were made covering the interval between the meetings. In many cases these periods were not of uniform length, so that it was difficult to make comparisons from year to year as to receipts and expenditures. Under the new plan it will be very simple to make such comparisons, inasmuch as each report will cover six months period.

The committee has considered from time to time the presentation of an annual budget. This has not been done for the reason that the various committees have not adopted definite programs for their activities and requested definite sums for their purposes. The committee recommends that it be empowered to solicit suggested budgets from the officers of the Society, the chairmen of committees and the executive secretary, and that a budget for 1931 be drawn up as soon as possible and presented to the Council.

Respectfully submitted,
John H. Fitzgibbon, *Chairman*,
Thompson Coberth,
Emil C. Joseph.

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

### Report of Committee on Cancer Control

The following report was read by the executive secretary:

Our committee continued its cooperation with the American Society for Cancer Control in the distribution of lay educational material through our Society headquarters. During the year the headquarters staff prepared several attractive window displays of the prevention of cancer, which resulted in an increased demand for literature on this subject. The chairman of the committee also made several talks before local medical societies and lay organizations on the prevention of cancer.

Respectfully submitted,
R. C. Coffey, *Chairman*,
J. Earl Else,
Laurence Selling.

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

### Report of Committee on Public Health and Disease Prevention

The Executive Secretary read the following report:

The physicians of this state are constantly confronted with the fact that time is changing many phases of practice. Much of the petty practice that once fell to the family physician is now cared for in other ways. The physicians of this state are beginning to feel the loss of practice and the consequent loss of income. But to offset this dwindling of practice and income, there are many newer lines of endeavor that should be fostered and encouraged. The immunization of children is a field of activity that has been encouraged by the State Board of Health. In response to this invitation, the physicians of the state have cooperated with the board and thousands of children have been immunized against diphtheria and smallpox.

There is another field that the physician should take an interest in and foster for the general good that it produces, mainly the preschool examination of children. In this way the physician will add very much to the efficiency of his practice. This type of work is a step forward and every physician should acquaint himself with the proper methods of examination.

There is still another new development in medicine that will add to the duties of a physician and enable him to render a service to the individuals and the community, the periodic health examination. Most of the physicians of this state are not sufficiently interested to make a thorough health promotion issue of medical practice. They forget that the strongest weapon that the physicians have at their disposal is to guard against disease.

If the physicians of this state were to make complete and thorough examinations of all our citizens, immunize all susceptibles and correct remedial defects, they would have plenty to do. There is plenty to do, but there is only lacking a method that will make this service available to all.

Times have changed, but the physicians must change too. The physician must realize that he has a duty to perform not only in the illness of his patients but in the prevention of their illness.

The rural districts are very much in need of scientific health work. A study of the school children of this state reveals the fact that rural children are much more handicapped than city children because of neglected remediable physical defects. There is a great need to extend organized health work beyond large cities. The small cities of this state are paying the penalty of negligence in health work. While protective health work is possible by the wise expenditure of money, it is not possible without adequate funds.

Experience in this state has shown that the best unit outside of cities is the county. The best solution of rural health problems is the full-time county health department, consisting of a health director, one or more nurses, when possible one or more sanitary officers and a clinical clerk. To accomplish results the workers in the County Health Unit must be full-time. Efficient health service results in life saving, disease prevention, health promotion and economic saving. The saving in dollars and cents amounts to many times the cost of the service.

The committee believes that an efficient full-time health department will do more to advance the legitimate practice of medicine than any other activity. The modern health department educates the people to appreciate what can be accomplished by modern scientific medicine. When health departments are financed so that they function efficiently there will be more work than the physician can care for properly.

Respectfully submitted,
Frederick D. Stricker, *Chairman*,
H. H. Foskett,
W. B. Morse,
George E. Houck,
W. T. Phy,
N. E. Irvine,
J. H. Rosenberg.

Upon motion duly made and seconded, it was voted that the foregoing report be accepted and placed on file.

### Report of Committee on Military Affairs

The Executive Secretary read the following report:

The committee activities were principally concerned with the Medical Reserve School which was conducted at Portland by Major Herbert O. Mallory of the Medical Corps of the U. S. Army, to which reserve officers of the medical, dental, veterinary, medical administrative and sanitary corps came for military instructions.

At the beginning of the medical reserve school at Portland, Major Mallory interested the leading medico-military men of the community, especially those who had seen previous military service and held responsible military positions during the late war. Among this number were many of the leading professional men of the Pacific Northwest and with their cooperation the school was made the largest in regular attendance of any reserve school in the United States.

The average attendance from October 1929, to May 1930, was 88.8. The record attendance was 163. Approximately 60 per cent of the class attending the school have either been promoted or have qualified for promotion by obtaining certificates of capacity.

Upon this record Major Mallory received a personal commendation from the Chief of Staff of the U. S. Army, Major General Charles P. Summeral, which amounted to what might be termed a peace time citation. He also received commendations from other prominent military officials, including Major General John L. Hines and Brigadier General James H. Reeves.

Major Mallory was appointed by the Surgeon General of the Army as Army Delegate to the American Medical Association, when the meeting was held in Portland. Upon collaboration with the Committee on Military Affairs of the Oregon State Medical Society, Major Mallory proposed the resolution before that body creating a permanent standing committee of the American Medical Association on military affairs.

Reserve schools were established at St. Helens, Oregon, and Vancouver, Washington.

The committee is pleased to report cooperation and assistance from a great number of reserve officers and wish to thank J. G. Strohm, R. A. Fenton, Archie Van Cleve, F. H. Dammasch, S. S. Skiff, Ben Wade, Chas. G. Sabin, Chas. J. McCusker, Roy Payne, Frank Butler, C. C. Wright of Vancouver, Washington; Donald MacClaire, H. C. Miller, C. H. Walrath, John Flynn, St. Helens; John Rankin Newberg, Ray W. Matson, Irving S. Lupton, and many others.

The committee appreciates the effort put forth by Major H. C. Mallory and recommend that one copy of this report be sent to the Adjutant General of the Army, one to the Surgeon General of the Army, as a matter of record in his personal file, and one copy to Major Mallory.

Respectfully submitted,
H. M. Greene, *Chairman*,
J. C. Ghormley,
Karl Swenson,
E. B. Stewart,
E. W. Howard.

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

### Report of Committee on Publications

The Executive Secretary read the following report:

To the officers and members of Oregon State Medical Society:

The Publication Committee presents the following report for the past year. By virtue of membership on this committee the members become trustees of NORTHWEST MEDICINE, your official publication, and their duties are confined to activities in its behalf.

We wish to commend the high type of scientific articles which are appearing in your Journal, and extend our thanks and appreciation to the editor, Dr. Clarence A. Smith, for his able efforts. It is the editor who is responsible for the type of journal, the trustees act only in an advisory capacity and merely control policies, and these to a limited extent.

The character and standing of NORTHWEST MEDICINE can best be determined by the frequency with which its articles are abstracted. At the last annual meeting we reported that in the 1928 Year Book of Surgery, Practical Medicine Series, abstracts from NORTHWEST MEDICINE constituted one out of each forty-six in the entire volume, being surpassed by only one State Medical Journal, Minnesota. We take pleasure in reporting that in the 1929 Year Book of Surgery one out of each fifty-eight abstracts is from your publication, and that NORTHWEST MEDICINE is quoted the third largest number of times of all state journals. When it is considered that other regions have a larger number of physicians and surgeons contributing, the greatness of the compliment to NORTHWEST MEDICINE is appreciated. It is also very frequently abstracted in the other volumes of the Practical Medicine Series of Year Book and by other abstractors. Dr. Smith deserves credit for his high editorial acumen

The financial condition of NORTHWEST MEDICINE is very good. We believe that a reserve should be maintained to be available in case of emergency. A journal such as NORTHWEST MEDICINE should not be operated for profit and all funds over the cost of publication and maintenance of a reserve, should be expended in bettering and enlarging the journal and its field of usefulness. NORTHWEST MEDICINE is just paying its way and shows only sufficient earnings to render it safely on the profit side. The resources were increased very little during the past year. We believe that fixed expenditures should not be increased at this time.

During the past year NORTHWEST MEDICINE lost one of its able associate editors in the death of Dr. William House. His editorials were always marked by erudition and broad vision and his efforts will be missed. Before the close of this meeting an appointment will be made to fill this vacancy.

We also have to report the resignation of the assistant to the editor, Dr. Harry C. Olmstead, whose efforts on behalf of NORTHWEST MEDICINE were greater than many realize.

We commend the Oregon State Medical Society for issuing its own bulletin, The Rod and Serpent, with which to keep in contact with its members and which serves a purpose not met by a scientific publication. The bulletin does not infringe on the field of NORTHWEST MEDICINE, as it does not publish scientific medical matter but confines itself to the organization and economic aspects of the state society.

C. J. SMITH, *Chairman,*
R. C. COFFEY,
A. G. BETTMAN.

Upon motion duly made and seconded, it was voted that the report be accepted and placed on file.

### Report of Committee on Medical Defense

Dr. R. C. McDaniel, chairman, presented the following report:

The object of the Medical Defense Fund is that in the near future this society will be able to finance its own medical defense to each and every member who is entitled to its benefits, who is a member of the State of Oregon Medical Society in good standing.

Since starting this fund, from the report of the treasurer, we have now $17,000 in AA securities towards this fund. From the figures of past years, I am of the opinion that if we can swell this fund to the amount of $50,000, we will be in the position to carry on our object in view, and our insurance will be cut at least 50 per cent of its premium which now averages $22.00 per year.

The committee recommends that the Councils of different County Societies will cooperate with the State Defense Committee in stimulating the working of this Committee, and if there are any members who are not familiar with the Defense Fund, we will be very glad to have any inquiries relative to this fund.

This report covers the period from May 1929 to September 1930. At the beginning of this period there were fourteen suits pending in the lower courts and one in the Supreme Court on an appeal following the rendering of a jury verdict against a physician. Twenty new suits were instituted during this period in which the plaintiffs sought damages aggregating $566,000. Since the last report twenty of the total of thirty-four cases under consideration were brought to issue with results as follows:

One settlement for $400.00 at the request of the physician.

Two jury verdicts in favor of the physician.

Three cases non-suited in favor of the physician without going to the jury.

Twelve cases dropped by plaintiff who had instituted suit.

Fifteen suits pending in the lower courts.

One case pending in the Supreme Court. Total 34 cases.

Both cases, in which jury verdicts were rendered against the physician, were appealed; one is on appeal before the Supreme Court, and the other is awaiting a motion for a new trial in the lower court.

Owing to better cooperation from the claim departments of the insuranc ecompanies handling our group liability insurance, the committee is able to report for the first time concerning the miscellaneous claims for damages which did not develop into suits, or which were not brought under observation. These claims may be summarized as follows:

Thirteen settled and dismissed without payment.

One settled for $35.00.

Three pending.

This way of handling such cases will not be tolerated by our committee in the future, as it does not enlighten the Defense Committee of the facts of the case.

The majority of these claims originate in cases where the patient is dissatisfied with the results of the doctor's treatment and threatens a malpractice suit, when the doctor brings suit to recover his fee. It is the opinion of the committee that many of these claims for malpractice are made because of the wide-spread practices of commercial agencies in bringing suits for the recovery of fees with practically no regard for the dissatisfaction which may possibly exist on the part of the patient. The committee is of the further opinion that many of these claims could be forestalled by our members turning over their delinquent accounts to the society's own credit bureau, where our own employees who understand this problem can deal more effectively with disgruntled patients. In any case there is no doubt that the doctor could frequently forestall the threatened malpractice suit in cases where there is dissatisfaction with the treatment, if he allow the statutory period of two years to elapse before attempting the collection of his fees, as claims under contracts are legally good in Oregon for a period of six years.

During the past year the committee has given a great deal of consideration to the matter of setting up a definite routine by which members may apply for medical defense. We have prepared a set of regulations covering the handling of requests for medical defense and it is recommended that these rules be mimeographed in our headquarters office and sent to every member of the society, in the next issue of the Rod and Serpent. We trust that this form will be studied by all and we invite criticism and recommendation.

The most disastrous suit of the year was the case of Blair vs. Dr. Joseph L. McCool of Portland, in which the patient secured a verdict for $25,000 alleging loss of sight due to an unauthorized operation. This suit was originally brought as a malpractice suit and was non-suited without going to the jury. The attorney for the plaintiff then brought a second suit, alleging technical assault and battery, claiming that the operation was done without the patient's consent.

The case of Hibley vs. Higgs was won on the following, doing an unauthorized operation by removing tonsils, and the jury gave Hibley a verdict for $1,000, though the defendant said that he removed these tonsils for the benefit of the patient who was anesthetized. This measure of damages recoverable for an unauthorized operation or treatment is the most difficult to defend.

These cases raised the question as to the advisability of securing the written consent for surgical procedures. The committee took this matter up with Carey and Kerr, our attorneys, and forms have been prepared for securing the written consent of an adult patient as well as the written consent of the parent and guardian in cases where a minor is operated on. Carey and Kerr on the whole did not look with a great deal of favor upon the plan of securing the written consent of the patient in every case, on the ground that such a procedure might react against the physician, in that it might sometimes be necessary for the good of the patient to go beyond the scope of the consent secured in written form. Their opinion, however, was that it might be possible to use such forms, if the physician were extremely careful in selecting the cases in which written consent is secured; for instance, that the patient, parent or guardian be mentally fit to understand a legal document, and is very doubtful if it would stand the strangulation of the court.

The committee recommends that the credit bureau committees of our component societies work more closely with the Medical Defense Committee in order that this class of claims may be materially reduced.

The committee has held the customary conferences with physicians, the claim agents and attorneys of the insurance companies and has endeavored to give earnest consideration to every case of alleged malpractice in which members have sought the assistance of the society. Our results are most gratifying as shown by our records, though we hope the number of cases will grow less each year.

Respectfully submitted,
Roy C. McDaniel, *Chairman*,
Frank E. Butler,
Leo S. Lucas.

Upon motion duly made and seconded, it was voted that this report be referred to the Council for consideration and action.

### Report of Committee on Public Education

The Executive Secretary read the following report:

The report of this committee can be briefly made. A careful and conscientious effort was made to study the problems of public relations for the State Society from the broadest possible aspects. The material from this study was incorporated into several short theses for presentation before members of the profession and before the laity. Talks were given before the laity in several instances, to the meeting of the secretaries of the component societies of the Oregon State Medical Association and to the Medical Society of Bend.

The findings of a study of this problem are available to the Society through the records of the chairman of this committee. It is notable that practically the only useful and applicable findings of this study were found to be already incorporated in the program made out by the executive secretary. A fairly ambitious series of talks to lay groups had already been organized and it is the opinion of this committee that every possible effort is being made to instruct outlying groups of physicians in regard to their obligations in this matter.

Recommendations: The committee recommends that the executive secretary be congratulated upon his foresight in attention to this problem. It further recommends that consideration be given before the component societies to the question of local newspaper publicity. It further recommends that the efforts of the secretary toward the promulgation of information in component societies be encouraged.

Respectfully submitted,
Goodrich C. Schauffler, *Chairman*.
Arthur S. Rosenfeld,
L. Howard Smith,

Upon motion duly made and seconded, it was voted that the foregoing report be accepted and placed on file.

### Report of Committee on Welfare

The Executive Secretary read the following report:

This committee has been working for two years in an endeavor to make some satisfactory arrangement with one of the large insurance companies to provide health, accident and life protection to our members under a plan similar to that under which the insurance companies protect the employees in large industrial concerns. We have not been able to secure a satisfactory arrangement for submission to the society, and it now seems doubtful whether the committee should be continued for this purpose.

In addition to studying the possibility of securing group insurance as outlined above, the committee has endeavored to keep in touch with all members who have been incapacitated during the year. The society office has also sent flowers for all the members who have died during the year. One or two cases have also arisen, where members of our society have died, leaving their families in circumstances which were at least temporarily embarrassing. The committee has endeavored to see that such situations were relieved but it is thought inadvisable to discuss these cases in detail.

Respectfully submitted,
John H. Fitzgibbon, *Chairman*.
Thomas J. Higgins,
E. W. St. Pierre.

Upon motion duly made and seconded, it was voted that the report of the committee be accepted and placed on file.

### Report of Committee on Prevention of Blindness

The Executive Secretary read the following report:

Your committee has continued the distribution of educational material on the prevention of blindness through society headquarters. There was a considerable increase in the demand for literature in this field during the past year.

In addition to this activity, arrangements were made with the Portland City and County Medical Society to devote one meeting to the subject of "Special Classes in Public School for Children with Deficient Sight." This meeting was devoted to a symposium in which Dr. Walter A. Hoffman of Seattle, Dr. Helen A. Carey and the chairman of this committee presented papers. The members of the Portland School Board were present and later voted to establish a sight-saving class in the Portland Schools this fall.

In June of this year the chairman of your committee presented a paper before the thirtieth annual meeting of the American Association of the Instructors of the Blind at Vancouver, Washington, on the subject of "Conservation of Vision from the Standpoint of the Physician and Surgeon." This paper appeared in the *Medical Sentinel*.

Respectfully submitted,
Frederick A. Kiehle, *Chairman*
Glenn G. Gordon
Clinton T. Cooke

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

### Report of Committee on Honorary Membership

The following report was read by the Executive Secretary:

The committee recommends the election to Honorary Membership of A. J. Giesy, E. A. Pierce, C. H. Wheeler and Kittie Plummer Gray of Portland.

The names of Doctors Giesy and Wheeler were presented at the last session but they were not elected to honorary membership. The committee understands that the rejection of these candidates was based upon the fact that they were financially able to pay the regular dues attaching to active membership. It is the opinion of the committee, however, that election to honorary membership being, as the name indicates, for purely a matter of conferring an honor, the question of financial ability should not be considered.

The committee regrets to report the death during the year of Dr. Mae Cardwell at East Era, Pennsylvania. Dr. Cardwell was an honorary member of the society for many years.

Respectfully submitted,
John F. Dickson, *Chairman*
Clyde T. Hockett
R. J. Pilkington

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

### Report of Committee on Necrology

The Executive Secretary read the following report:

The past year has taken a heavier toll of the physicians in Oregon than any previous year in the history of the Society. Twenty-seven deaths of physicians, of whom twenty-five were at one time members of the Society, and eleven were active members at the time of their death.

Dr. Hugh S. Mount, a former president of the Society, at the crowning moment of an honorable and successful career.

Mae Whitney Cardwell, for a generation the treasurer of the Society.

Harold Bean, brilliant, genial, talented and one of the best loved members.

William House, a former secretary and president. Chairman of the Neurological Section of the A. M. A. Leaves a void that cannot be filled.

Alan Noyes, young, successful obstetrician scarce reached the prime of life.

M. K. Hall many years a councilor, philosopher, raconteur and a most genial friend.

L. F. Griffith, alienist and the state's most valued employee.

W. P. McAdory, a member of the present Council.

Henry F. Fleckenstein, scarce reached middle age.

Philip Keizer, just at the highway of success.

It is well there is no definite measure for our span of life. No depressing preparation for the end.

Manifestly, the practice of medicine is trying and difficult, and wrecks sooner or later this mechanism we call our bodies. May we, in paying this tribute to our departed members, take to ourselves this lesson. "That when the summons comes to join that innumerable caravan that moves into the silent halls of death," it may be said of us as by the Great Apostle. "We have fought a good fight. We have finished the course."

Calvin S. White, *Chairman*
H. J. Kavanaugh
George E. Houck

Upon motion duly made and seconded, it was voted that this report be accepted and it be read at the general session on Friday afternoon.

### Report of Committee on New Business

Dr. J. Earl Else, chairman, presented a resolution providing for the establishment of a centralized administrative committee, consisting of representatives of the various organizations which cooperate in maintaining the Portland headquarters. Following extended discussion on this resolution, President Johnston referred it back to the committee with the suggestion that they redraft the resolution for presentation at the Friday session.

### Legislation Proposed by Oregon Public Health League

Dr. E. A. Sommer, President of the League, gave a brief outline of proposed legislation to give physicians a preferred lien on moneys recovered by patients in cases of accidental injury. After considerable discussion regarding various aspects of the proposed legislation, Dr. Sommer stated that he had merely wished to inform the delegates concerning this legislation and that no action by the House was necessary at this time.

### Proposed Amendments to By-Laws

Dr. C. L. Booth, chairman of the Committee on Revision of Constitution and By-Laws, presented the following report:

Your Committee on Revision of Constitution and By-Laws beg to make the following recommendations:

1. That Section 6 of Chapter VII of the By-Laws be amended so as to read as follows:

The Council shall appoint at least six months before the annual meeting, a committee, consisting of at least one of its members, to be known as the Committee on Arrangements for the annual meeting. Upon recommendation of this committee, the Council shall appoint a general chairman of a local Committee on Arrangements who shall be a member of the component society of the county in which the annual meeting is to be held, and who shall appoint and organize from the members of this county society the personnel of the local Committee on Arrangements. The local Committee on Arrangements shall provide suitable meeting places and shall have general charge of all local arrangements, including Clinics and Scientific Exhibits, subject to the approval of the Committee on Arrangements for the annual meeting.

2. That there be added to Chapter V of the By-Laws a new section to be known as Section 5.

A. For the purpose of securing proper representation on the council, the state shall be divided into seven councilor districts as follows:
   District No. 1—Multnomah and Clackamas counties.
   District No. 2—Columbia, Clatsop, Tillamook and Yamhill counties.
   District No. 3—Marion, Linn, Lane, Benton, Polk and Lincoln counties.
   District No. 4—Douglas, Jackson, Josephine, Curry and Coos counties.
   District No. 5—Jefferson, Crook, Deschutes, Klamath, Lake and Harney counties.
   District No. 6—Hood River, Wasco, Sherman, Gilliam, Morrow, Wheeler, and Grant counties.
   District No. 7—Umatilla, Union, Wallowa, Baker, and Malheur counties.

B. The House of Delegates shall apportion the Councilors to the districts according to the number of members of the Oregon State Medical Society living in the various districts, provided, however, that each district shall have at least one councilor.

C. Only duly licensed physicians in active practice, resident in a councilor district shall be elected as councilor for that district.

D. Until the expiration of the terms of office of the present councilors, the apportionment shall be one councilor for each district, except District No. 1, which shall have three, and for this period the president shall assign said councilors to those districts for which councilors have not yet been elected in the above prescribed manner.

3. That there be added to Chapter VI of the By-Laws a new section to be known as Section 5.

A. Duties of Councilors.
   1. The Councilor shall be responsible for the organization of medical societies in each county in his district where possible.
   2. The Councilor shall visit the medical societies of the counties in his district at least once each year.

4. Your committee had a very pleasant and informative meeting with some of the proponents of the resolution for the abolition of the League, as well as others, and find that there is great lack of understanding as to the functions and purposes of the League.

We believe that the time at the command of your committee and of the House of Delegates is too brief to review this whole matter and to make changes necessary to carry out the purposes of the resolution without danger of disrupting the whole legislative program of the society. We, therefore, recommend that the President be instructed to appoint a committee of five members of this society, part of whom shall represent the ideas of the proponents of this resolution and part shall represent the ideas as those favoring the present plan, which committee shall collaborate with the Council of the State Society in a study of the whole problem and report at the 1931 session, with recommendations for any changes of plans, or of Constitution and By-Laws, that they may deem necessary.

We believe that all ground for suspicion that the League is usurping the function of the State Society should be and can be removed.

To this end we recommend that every member of this House of Delegates attend the meeting of the League today and exercise his prerogatives of a full voice in directing its policy and electing its officers.

Respectfully submitted,
C. L. Booth, *Chairman*
E. B. Pickel
Lee B. Bouvy
William Kuykendall
E. B. McDaniel

Upon motion duly made and seconded, the preceding report was accepted and the proposed amendments to the By-Laws laid on the table until the final meeting of the House on Friday.

Upon motion duly made and seconded, it was voted to adjourn until Friday at 7:00 A. M.

### Third Session

*Friday, September* 19

The House was called to order by President Johnston at 7:00 A. M. in the Grille Room of the Portland Hotel.

On roll call the following officers and councilors were present: Wilson Johnston, J. Earl Else, E. L. Zimmerman, Thomas E. Griffith, R. H. Wellington, Frederick D. Stricker, Joseph A. Pettit, William Kuykendall, C. L. Booth, Charles E. Sears, Frank R. Mount, W. B. Morse, E. A. Sommer, E. B. McDaniel and the executive secretary.

The following delegates were present: W. T. Johnson, N. L. Tartar, N. E. Irvine, Charles E. Hunt, R. J. Pilkington, Russel Keizer, A. M. Wade, Lee B. Bouvy, E. B. Pickel, H. J. Clements, F. K. Power, Frank E. Boyden, W. K. Livingston, Homer P. Rush, Karl H. Martzloff, R. C. McDaniel, Harry M. Hendershot, Blair Holcomb, Albert W. Holman, Charles R. McClure, John R. Montague, C. C. Moore, E. W. St. Pierre, Goodrich C. Schauffler, B. A. Van Loan, Wayne J. Stater, A. M. Webster, and C. T. Sweeney.

Clarence A. Smith, editor of Northwest Medicine, A. G. Bettman of the Committee on Publications, and W. J. Gilstrap and C. Harold Palmer, members, were also present.

### Report of Committee on State Industrial Affairs

The executive secretary read the following report:

*Gentlemen*:

We, your Committee on Industrial Affairs, beg leave to make the following report:

Early in the year we had a meeting at our instance with the State Industrial Accident Commission, at which a general discussion took place regarding the relations between the Commission and the medical profession. A short time ago we had another meeting on the invitation of the Commission, at which time a very free interchange of ideas took place, and the ground-work was laid for a much better understanding on the part of both. Following this, the Commission appeared by representation, in the person of Mr. Fitzgerald, at the last meeting of the Council, at which time a free and friendly discussion was taken part in by all. Many questions were asked and answered, and we think the way opened for a complete mutual understanding.

The Interim Committee for investigation of the State Industrial Accident Commission, contemplating a report to the next legislature, has been at work all this year. Before the legislature meets, it will hold open meetings, at which time all parties will have the privilege of being heard. This will be a very important occasion for us, and a committee should go there well prepared.

The resolutions offered by the Portland City and County Medical Society on State Industrial Accident Commission have been handed to us for analysis and comment.

Referring to Section 1 of the resolution: Upon careful investigation and seeing the financial report of the Commission, we find that the financial condition of the Commission will not permit the raising of fees at this time.

Referring to Sections 2 and 3, a to f,: These are covered by the Liaison Committee already suggested by the Industrial Accident Committee to the Interim Committee.

Section 4. Approved.

Section 5. Impracticable. We quote from an analysis by the State Industrial Accident Commission as follows:

*Medical Aid.* The cost of medical aid presented quite a serious problem to the Commission. An analysis of the situation developed the fact that a great many physicians throughout the state were abusing the privileges granted them under the Compensation Law in caring for industrial accidents in the following manner:

Charging exorbitant fees from operations not covered by fee schedule.

Requesting workmen to report back for unnecessary treatments for minor cases.

Giving physiotherapy daily for all conditions and administering treatment of this nature in a far greater manner than many cases would appear to warrant.

Reporting sickness cases as accidents in order to secure compensation for workmen and payment of medical services for themselves.

There are at present two members of our profession in Oregon under indictment by grand juries for filing with the Commission falsified accounts.

Referring Section 6:

a. No competent physician would take the job for the salary.
b. Has already been done.
c. This has been found absolutely impossible because when the rates are raised employers refuse to come under the State Industrial Accident Commission.

After hearing the evidence submitted, we arrive at the following conclusions:

That one committee, composed of the Committee on Industrial Affairs of the State Society and a member of each of the component societies, agree upon a policy to present to the Interim Committee of the State Legislature to present the policy of the State Society.

1. That we favor a compulsory law for all persons engaged in hazardous occupations.
2. That we favor an amendment to the law and the policy of the Commission which will enable the workmen to employ the doctor of his own choice.

Conclusion of this Committee:

First. We find the Commission ready to cooperate with us to a degree which is all that we have a right to expect.

Second. They have already arranged to carry out some of the things which we want.

Third. What they will or can do in the future will depend to a considerable extent upon the recommendations of the Interim Committee and the consequent action of the legislature.

Some of the things asked for by the profession will demand a change in the law, and the nature of such change cannot be determined until after the report of the Interim Committee. In our opinion much may be accomplished by a spirit of friendly cooperation on both sides and this exists at present.

This is no time for us to consider using the "big stick" because we do not know exactly what to use it for, nor what to expect as results if we do use it. Also, we should not use it if we are not in good position to have the Commission use the "big stick." Our case will not stand in a Court of Equity until we have cleaned our own house. The Commission has some things against us which require our attention; for example, an indictment against two of our fellows for filing with the Commission what are said to be dishonest accounts. We, therefore, at this time strongly advise a spirit of friendly cooperation with the Commission as the best method of ironing out the difficulties on both sides.

Anyone aware of specific instances of apparent wrong doing on the part of the Commission should submit the same in writing to the Committee on Industrial Affairs or the Interim Committee.

Apparently the Committee on Industrial Affairs, which will follow this one for the coming year, will have much work to do, and we hope very much may be accomplished.

Respectfully submitted,
W. B. Morse, *Chairman*
E. B. McDaniel
Joseph A. Pettit
Lee B. Bouvy

After considerable discussion, upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

### Report of Committee on New Business

Dr. J. Earl Else, chairman, presented the recommendations of the committee as follows:

1. The Committee recommends to the medical organizations using the headquarters office that a central headquarters committee be formed consisting of the secretary of each organization who shall have power to act upon such matters as may properly come before them.
2. The Committee recommends that authorization be given for the study of various plans under which component societies might make contracts with industrial concerns for the care of sick and injured workmen.
3. The Committee recommends that a committee of five be appointed to consider the question of the Oregon State Medical Society entering into contracts for health and accident insurance. The presidents of the component societies and the president of the State Society shall be ex-officio members. The Council of the State Society is hereby authorized to appropriate such funds as in their judgment is needed by the committee for this study. The committee shall report to the House of Delegates at its next annual meeting.
4. The Committee recommends Eugene as the place of meeting for 1931.
5. The Committee recommends that the president at the beginning of each year, with the advice and consent of the Council, announce a program of work for the year, and that the component societies shall be asked to participate in this program.

Upon motion duly made and seconded, it was voted to accept the report of the Committee and approve the recommendations contained therein.

### Report of Committee on Resolutions

The executive secretary read the following resolution on food quackery prepared by the committee:

Whereas: Much misinformation is promulgated today on the question of diets, etc., causing the introduction of many diet-food fads.

Very few of these fad foods can take the place of the older staple foods, good meat, dairy products, green vegetables, fruits and the better grades of bread.

Any balanced diet should contain animal protein, fruits, vegetables, especially the leafy vegetables, which will insure adequate vitamin and mineral salt content, digestible fat such as butter-fat, and sufficient of the digestible carbohydrates to afford readily available energy.

Carbohydrates, including sugars and starches, but especially starches, furnish the American public their main fuel for energy, the quantity varying with the amount of physical activities which the individual expends.

The allegation that white bread, meat or any other staple food, when employed in mixed diet is responsible for certain grave illnesses, is not supported by scientific facts.

Therefore, Be It Resolved: That we desire in the public interest, to place on record that in our opinion:

1. The exaggerated claims for various fad foods are entirely unwarranted by scientific evidence or practical experience; and the advertising and other propaganda furthering their substitution for the older articles of diet should be condemned.
2. The danger of nutritional deficiencies has been grossly exaggerated. No one food is a perfect food; but a diet consisting of dairy products (especially milk) leafy vegetables, fruits, meats and easily digested starches for heat and energy, furnishes an excess of all food factors necessary for proper growth and nutrition and resistance to disease.
3. Any variation from normal diet should only be prescribed by a properly trained physician after a careful study of the dietary requirements of the individual seeking advice.

Lee B. Bouvy, *Chairman*
Eugene Rockey
E. L. Zimmerman

Upon motion duly made and seconded, this resolution was adopted.

### Amendments to By-Laws

Dr. C. L. Booth moved the adoption of the following amendments to the By-Laws which were presented at the Thursday evening session. The motion was seconded and the amendments were unanimously adopted as follows:

1. To amend Section 6 of Chapter VII to read as follows:

The Council shall appoint, at least six months before the annual meeting, a committee, consisting of at least one of its members, to be known as the Committee on Arrangements, who shall be a member of the component society of the county in which the annual meeting is to be held, and who shall appoint and organize from the members of this county society the personnel of the local Committee on Arrangements. The local Committee on Arrangements shall provide suitable meeting places and shall have general charge of all local arrangements, including clinics and scientific exhibits, subject to the approval of the Committee on Arrangements for the annual meeting.

2. To add a new Section 5 to Chapter V as follows:

A. For the purpose of securing proper representation on the Council, the state shall be divided into seven councilor districts, as follows:
   District No. 1—Multnomah and Clackamas counties.
   District No. 2—Columbia, Clatsop, Tillamook and Yamhill counties.
   District No. 3—Marion, Linn, Lane, Benton, Polk and Lincoln counties.
   District No. 4—Douglas, Jackson, Josephine, Curry and Coos counties.
   District No. 5—Jefferson, Crook, Deschutes, Klamath, Lake and Harney counties.
   District No. 6—Hood River, Wasco, Sherman, Gilliam, Morrow, Wheeler and Grant counties.
   District No. 7—Umatilla, Union, Wallowa, Baker and Malheur counties.
B. The House of Delegates shall apportion the Councilors to the districts according to the number of members of the Oregon State Medical Society living in the various districts, provided, however, that each district shall have at least one councilor.
C. Only duly licensed physicians in active practice, resident in a councilor district shall be elected as councilor for that district.
D. Until the expiration of the terms of office of the present councilors the apportionment shall be one councilor for each district except District No. 1, which shall have three, and for this period the president shall assign said councilors to those districts for which councilors have not yet been elected in the above prescribed manner.

3. To add a new Section 5 to Chapter VI, as follows:

A. Duties of Councilors.
   1. The councilor shall be responsible for the organization of medical societies in each county in his district where possible.
   2. The councilor shall visit the medical societies of the counties in his district at least once each year.

### Report of Committee on Nominations

Dr. Lee B. Bouvy, chairman, read the following recommendations of the Committee:

For member of Committee on Publication:
For three year term ending in 1933—Robert C. Coffey.
For President-Elect—H. J. Clements, Salem.
For First Vice-President—E. L. Zimmerman, Eugene.
For Second Vice-President—John H. Fitzgibbon, Portland.
For Third Vice-President—Wm. T. Johnson, Corvallis.
For Secretary—Frederick D. Stricker, Portland.
For Treasurer—R. H. Wellington, Portland.
For Councilors, for three-year term ending in 1933:
Second District—Frank R. Mount, Oregon City.
Fourth District—George Houck, Roseburg.
Sixth District—Thompson Coberth, The Dalles.
For one-year term ending in 1931:
Seventh District—Lee B. Bouvy, La Grande.

Upon motion duly made and seconded, Dr. Robert C. Coffey was elected as a member of the Committee on Publication for the three-year term ending in 1933 and the nominations of the Committee for the officers of the Society were approved for submission to the Society.

At 9:00 A. M. the House adjourned *sine die.*

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## GENERAL BUSINESS SESSION OF THE SOCIETY

*Friday, September* 19

The business session of the Society was called to order by President Johnston at 2:00 P. M. in the auditorium of the Medical-Dental Building.

### Report of the House of Delegates

The Secretary made the following report of the actions of the House of Delegates:

As Secretary of this Society, I desire to present for your consideration the following summary of the actions of the House of Delegates:

#### ATTENDANCE

The attendance at the meetings of the House of Delegates was the best in the history of the Society. Every component society except one sent representatives. There were over fifty delegates in attendance at each of the three meetings of the House.

#### MEMBERSHIP

The executive secretary reported a total membership of 710 which fulfills our membership goal of 700 which was set in 1926, when our full time executive secretary plan was adopted.

#### FINANCES

The report of the Treasurer showed that the Society has a reserve fund of over $27,000, the major portion of which is invested in interest bearing securities of high grade.

#### GENERAL ACTIONS AND RESOLUTIONS

1. Voted to donate the balance of approximately $300.00 remaining in the fund created by physicians for the entertainment of the A. M. A. last year to the Portland Public Library for the purchase of books for the use of nurses.

2. Accepted the invitation of the Lane County Medical Society to hold the 1931 session at Eugene.

3. Adopted a resolution commending the Executive Secretary for his excellent work during the past four years.

4. Accepted the conclusions presented by the Committee on State Industrial Affairs as follows:

(a) That a committee be appointed composed of State Industrial Affairs Committee and one member from each of the component societies to present to the Interim Committee of the State Legislature the policy of the Oregon State Medical Society which should include the recommendations that:

1. The Workmen's Compensation Act should be made compulsory upon all employers and employees engaged in hazardous occupations.
2. That the act should be amended to enable every worker to employ the physician of his own choice.

(b) That the Oregon State Medical Society in dealing with the Industrial Accident Commission considering the various problems arising out of the relations with the medical profession should observe a spirit of friendly cooperation.

5. Adopted a resolution calling for the establishment of a centralized administrative committee to consist of the secretaries of the Oregon State Medical Society, Oregon Public Health League, Portland City and County Medical Society, and the Medical Society Telephone Exchange Service for the purpose of making recommendations to their various organizations concerning the administration of the joint headquarters in the Medical-Dental Building at Portland.

6. Announced that the Oregon Public Health League is considering legislation to be presented at the coming session of the state legislature to give the physician a preferred lien on moneys recovered by patients who have suffered accidental injuries.

7. Adopted a resolution condemning the exaggerated claims made by promoters of various fad foods and expressed the view that any variation from normal diet should only be prescribed by a properly trained physician after a careful study of the dietary requirements of the individual seeking advice.

8. Authorized a study of the desirability of county medical societies incorporating and entering into contracts for the care of sick and injured persons.

9. Adopted a resolution recommending that the President announce for the information of all the component societies the program of activities for his term of office after it is approved by the Council.

10. Adopted the recommendation of the Committee on Revision of Constitution and By-Laws instructing the President to appoint a committee of five members of the society to collaborate with the Council in a study of the problem of the relation of the Oregon Public Health League to the Oregon State Medical Society; this committee to make a report of their conclusions at the 1931 session with such recommendations for changes in the present plan of organization and in the constitution and by-laws as may be deemed necessary.

### Amendments to the By-Laws

The following amendments to the By-Laws were presented at the first meeting of the House on September 18th and adopted at their third meeting on September 19:

1. That Section 6 of Chapter VII be amended to read as follows: (See Report of House of Delegates, page 547).
2. That a new Section 5 be added to Chapter V as follows: (See Report of House of Delegates, page 547).
3. That there be added a new Section 5 by adding to Chapter VI as follows: (See Report of House of Delegates, page 547).

### Necrology

The House voted that the report presented by Dr. Calvin White, chairman of the Committee on Necrology be read before the general meeting of the Society. This report is as follows: (See Report of House of Delegates, page 545).

#### ELECTION OF MEMBER OF COMMITTEE OF PUBLICATIONS FOR THREE-YEAR TERM ENDING IN 1933

ROBERT C. COFFEY, *Portland*

#### HONORARY MEMBERS

The House approved the report of the Committee on Honorary Membership, in which the following physicians were recommended for election to Honorary Membership: A. J. Giesy, E. A. Pierce, C. H. Wheeler and Kittie Plummer Gray, all of Portland.

#### VACANCY IN OFFICE OF PRESIDENT

The house approved the previous action of the Council in appointing Thomas E. Griffith of The Dalles to fill the vacancy created by the removal from the state of President-Elect John W. Sifton of Hood River.

Respectfully submitted,
FREDERICK D. STRICKER.

### Election of Officers

The Secretary reported that the House of Delegates had voted to recommend the following list of nominees for the various offices of the Society: (See Report of Report of House of Delegates, page 548).

On call by President Johnston for further nominations from the floor, E. L. Zimmerman of Eugene was nominated for President-Elect; H. J. Clements of Salem for First Vice-President; Frank E. Fowler of Astoria for Councilor for the Second District; Ernest A. Woods of Ashland for Councilor for the Fourth District.

The members voted by individual secret ballot, following which President Johnston announced that the results of the balloting were as follows:

President-Elect—E. L. Zimmerman, Eugene.
First Vice-President—H. J. Clements, Salem.
Second Vice-President—John H. Fitzgibbon, Portland.
Third Vice-President—William T. Johnson, Corvallis.
Secretary—Frederick D. Stricker, Portland.
Treasurer—R. H. Wellington.
Councilors:
Second District—Frank E. Fowler, Astoria.
Fourth District—Ernest A. Woods, Ashland.
Sixth District—Thompson Coberth, The Dalles.
Seventh District—Lee B. Bouvy, La Grande.

President Johnston expressed his thanks to the Society for the honor of having served as its president, following which he announced that it was now in order to seat the new president, Dr. Thomas E. Griffith. Dr. Griffith was then escorted to the chair.

Dr. Griffith then made a short speech, in which he expressed pleasure at the receipt of the honor of serving as president and pledged himself to execute the duties of the office to the fullest extent of his capacity.

The business session of the Society was declared adjourned at 3:00 P. M., and the Society assembled in scientific session.

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## OREGON PUBLIC HEALTH LEAGUE

### REPORT OF ANNUAL MEETING HELD IN THE GRILLE ROOM OF THE PORTLAND HOTEL FRIDAY, SEPTEMBER 19, 1930

The annual meeting of the Oregon Public Health League was called to order by President E. A. Sommer at 12:30 p. m.

The following officers were present: E. A. Sommer, Noble Wiley Jones, Thomas E. Griffith, Frederick D. Stricker, Frank E. Boyden, W. B. Morse, E. B. McDaniel, C. J. McCusker, and the executive secretary.

The following directors were present: Wilson Johnston, E. B. Pickel, Ernest A. Woods, Lee B. Bouvy, T. Homer Coffen, Robert C. Coffey, J. Earl Else, and William Kuykendall.

The following members were present: C. T. Sweeney, J. Guy Strohm, L. P. Gambee, Albert W. Holman, Homer P. Rush, R. C. McDaniel, Oliver M. Nisbet, W. D. Lockwood, Goodrich C. Schauffler, John R. Montague, Stanley Lamb, A. G. Bettman, George K. Armen, H. M. Greene, C. L. Booth, A. G. Allen, Russell Keizer, H. J. Clements, Joseph A. Pettit, Karl H. Martzloff, W. K. Livingston, N. E. Irvine, Irvin R. Fox, F. E. Adams, Charles E. Hunt, Leslie S. Kent, E. L. Zimmerman, and A. W. Moore. Clarence A. Smith of Seattle was also present.

Upon motion duly made and seconded, it was voted to dispense with the reading of the minutes of the last meeting, the same having been printed in the August, 1929, number of NORTHWEST MEDICINE.

President Sommer made a brief talk concerning the economic and political problems confronting the medical profession and stressed the need for presenting a united front on these problems.

Dr. E. B. McDaniel made a brief talk concerning the early struggles of the League and the contributions made by some of the older members of the profession. Dr. McDaniel moved that a letter expressing sympathy and regret at the enforced absence of Dr. C. J. Smith from the meeting be sent to Dr. Smith together with a suitable gift of flowers. This motion was seconded and unanimously passed.

### Report of Executive Committee

The Executive Secretary read the following report of the Committee:

Owing to the fact that the past year has not been a legislative year, the activity of this committee has been largely confined to the consideration of future plans. In the primary election, however, the committee reviewed the records of the candidates for the coming legislature and sent out a bulletin of information to assist physicians in selecting candidates whose attitude was known to be favorable to public health and scientific medicine. Several candidates who have been inimical in the past were defeated at the election and we have the good fortune to report the nomination of three physicians, all of whom will probably be elected in November. This is the best representation of the medical profession in the legislature for many years.

A great deal of consideration was also given during the past year to the possibility of securing the enactment of a Basic Science law by means of an initiative but after consultation with several leaders in the legislature, however, it has been decided that it would be unwise to attempt to secure such legislation until the newspapers and general public are more aware of the necessity of a Basic Science act as a protection against incompetent practitioners and until there is greater unanimity among the medical profession concerning this legislation.

As a result of this decision no extensive program of a positive character is contemplated at the coming session of the legislature. A special committee is working on proposed legislation to bring hospitals and clinical laboratories under the supervision of the State Board of Health and it is likely that legislation for this purpose will be presented. It is expected, however, that we will be confronted with a defensive fight against certain "cult" legislation. The chiropractors and naturopaths appear to be making a concerted attempt to increase the scope of the therapeutic measures which they may legally use particularly in the field of obstetrics. It also appears that the cults are fighting more vigorously than ever to secure admission to the staffs of public hospitals. The defeat of this legislation will require the organized cooperation of the component medical societies. We recommend that the officers of all component societies immediately take up with their members the question of appointing an active legislative committee which will contact the members of the legislature in their district and inform them as to proposed legislation. This contact should be maintained throughout the legislative session. Bulletins of information will be sent from the state medical society to the officers of all component societies regarding legislative matters and it is of the utmost importance that these reports be considered as promptly as possible and the necessary action taken.

Respectfully submitted,
E. B. MCDANIEL, *Chairman*,
JOHN H. FITZGIBBON,
NOBLE WILEY JONES,
C. J. MCCUSKER,
THOMAS E. GRIFFITH.

Upon motion duly made and seconded it was voted that this report be accepted and placed on file.

President Sommer gave a brief outline of proposed legislation to give physicians a preferred lien on moneys recovered by patients in cases of accidental injury.

### Report of Treasurer

Dr. Frank E. Boyden, Treasurer, presented the following report of the finances of the League, as prepared by P. W. Janney, certified public accountant:

Statement of Net Worth as of June 30, 1930

| | | |
|---|---|---|
| ASSETS | | |
| Cash | $831.40 | |
| Prepaid rent | 50.00 | |
| Office furniture | 222.70 | |
| Accounts receivable, Oregon State Medical Society | 853.62 | |
| | | $1,957.72 |
| LIABILITIES | | |
| Net worth | | $1,957.72 |

Statement of Cash Receipts and Disbursements
January 1, 1930 to June 30, 1930

| | | |
|---|---|---|
| Balance January 1, 1930 | | $1,228.97 |
| Receipts: | | |
| Oregon State Medical Society | $2,400.25 | |
| Medical Society Telephone Service | 150.00 | |
| | | 2,550.25 |
| | | $3,779.22 |
| Disbursements: | | |
| Salaries | $2,300.00 | |
| Office supplies and expense | 113.55 | |
| Postage and express | 50.06 | |
| Telephone and telegraph | .60 | |
| Rent | 300.00 | |
| Traveling | 82.86 | |
| Publicity | 30.00 | |
| Auditing | 31.25 | |
| Miscellaneous | 39.50 | |
| | | 2,947.82 |
| Balance June 30, 1930 | | $ 831.40 |

Statement of Income and Surplus

| | | |
|---|---|---|
| Income: | | |
| Oregon State Medical Society | $3,476.62 | |
| Interest | 150.00 | |
| | | $3,626.62 |
| Expenses | | 2,947.82 |
| Net income | | 678.80 |
| Net worth January 1, 1930 | | 1,278.92 |
| Net worth June 30, 1930 | | $1,957.72 |

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

### Election of Directors

Dr. Sommer asked if the members had any new business to present before the meeting. No new business was presented and Dr. Sommer then announced that the next order of business was the elections of six directors for the three-year term ending in 1933.

The following nominations were made: W. K. Livingston, Blair Holcomb, and Homer P. Rush of Portland, Walter E. Nichol of Hood River, Irvin R. Fox of Eugene, and W. B. Morse of Salem.

Upon motion duly made and seconded, it was voted that the nominations be closed and the executive secretary be instructed to cast a unanimous vote for the above named candidates. The executive secretary, as instructed, cast the unanimous vote for these candidates and they were declared elected.

The meeting adjourned at 1:45 p. m.

### Meeting of Directors

Dr. Sommer announced that, inasmuch as there was an excellent representation of the directors present, they could go into session for the purpose of electing the officers and the executive committee for the ensuing year.

Dr. Sommer called for nominations with the following results:

For President—E. A. Sommer, Portland.
For Vice-President—Ralph A. Fenton, Portland.
For Second Vice-President—Walter E. Nichol, The Dalles.
For Secretary—Frederick D. Stricker, Portland.
For Treasurer—Frank E. Boyden, Portland.
For Executive Committee—E. B. McDaniel, Portland; Wilson Johnston, Portland; Homer P. Rush, Portland; Albert W. Holman, Portland; Thomas E. Griffith, The Dalles.

Upon motion duly made and seconded, it was voted that the nominations be closed and the executive secretary be instructed to cast a unanimous ballot for these candidates. The executive secretary, as instructed, cast a unanimous ballot and the above-named candidates were declared elected.

The meeting adjourned at 2:00 p. m.

## PORTLAND CITY AND COUNTY MEDICAL SOCIETY

Pres., F. A. Kiehle; Secty., H. P. Rush

The first regular meeting of Portland City and County Medical Society was held October 1 in the Auditorium of the Medical-Dental Bldg., Portland, being called to order by President F. A. Kiehle.

The paper of the evening was on "The Sympathetic Nervous System," presented by W. K. Livingston.

A regular meeting of the society was held October 15. The program consisted of a paper on "A Study of Sedimentation Rates," by Albert Mathieu. The second paper on "Parathyroid Tetany" was presented by John C. Brougher of Vancouver.

## POLK-YAMHILL-MARION MEDICAL SOCIETY

Pres., G. C. Knott; Secty., W. W. Baum

The regular monthly meeting of Polk-Yamhill-Marion Medical Society was held in Corvallis, October 7, being a joint meeting with Central Willamette Society.

Dr. Wesley E. Gatewood of Portland read a paper on "The Cerebral Manifestations of Hypertensive Disease."

Dr. Goodrich C. Schauffler of Portland read a paper on "Gynecology in Young Girls and Infants."

## WASHINGTON

## PIERCE COUNTY MEDICAL SOCIETY

Pres., D. M. Dayton; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in the roof garden of the Winthrop Hotel October 14, 1930, Dr. D. M. Dayton in the chair. Minutes of the previous meeting read and approved.

### CASE REPORTS

Dr. E. A. Rich presented two case reports, one of a dislocation of the hip with fracture of the acetabulum; the other a fracture of the head of the femur, with the head separated into two parts. Both cases are making good recovery.

### SYMPOSIUM ON CHEST TUMORS

Dr. Christen Quevli, Jr., read a paper covering the subject and limited his remarks to malignant tumors. His paper was illustrated with several lantern slides.

Dr. Allen L. Hart spoke of the diagnosis of malignant tumors of the chest, and illustrated his talk with slides. He stated that the most important thing was the diagnosis between primary and metastatic tumors, because much needless surgery was done on tumors in other parts of the body in which metastasis to the lungs had already taken place.

These papers were discussed by Drs. P. C. Kyle, Christen Quevli, Sr., and John F. Steele.

### BUSINESS

Drs. P. C. Kyle and Allen L. Hart were elected to membership in the society.

## SPOKANE COUNTY MEDICAL SOCIETY

Pres., C. B. Ward; Secty., R. P. DeRiemer

The regular monthly meeting of the Spokane County Medical Society was held at Spokane, Thursday, October 9 in the Paulsen Medical and Dental Building Auditorium. Dinner was served at 6:30 p.m. There were about seventy-five members present.

Drs. Austin J. O'Leary of Spokane and V. G. Backman of Spokane were unanimously elected to membership in the society.

### PROGRAM

"Obstructive Laryngeal Dyspnea." Dr. A. N. Codd.

"Technic and Indications for Avertin Anesthesia." Dr. M. J. Kalez.

"Coronary Thrombosis." Dr. John T. Bird.

The program was arranged by Dr. J. G. Cunningham. The next meeting will be held on November 13 and will be in charge of Dr. O. M. Rott.

## WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., J. T. Rooks; Secty., C. J. Johannesson

Walla Walla Valley Medical Society held its monthly meeting at Walla Walla October 9.

Dr. Herbert E. Coe of Seattle delivered an address illustrated with lantern slides on "Cleft Lip and Palate." He discussed the nature of these defects and explained the method of treatment with results obtained.

Dr. Alfred O. Adams of Spokane discussed "The Crippled Child," his address being illustrated by lantern slides. Dr. C. W. Countryman of Spokane reported a malignant tumor involving the heart and liver.

The following officers were elected for the ensuing year: President, F. M. Campbell; vice-president, E. J. Rhoades; secretary, G. C. Daniel; treasurer, J. E. Vanderpool. Board of Censors: C. E. Montgomery, G. R. Gowan and C. J. Johanneson.

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# BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Nervous Indigestion. By Walter C. Alvarez, M.D., Associate Professor of Medicine, Mayo Foundation, University of Minnesota. Cloth. 297 pp. $3.75. Paul B. Hoeber, Inc., New York, 1930.

Those familiar with the writings of Alvarez will know what a facile and picturesque pen he wields so that the pleasure of perusing this book is made doubly interesting both by its material and style. The author points out in his preface how frequent functional disorders of the digestion are in everyday practice and yet how comparatively little is taught about them in medical schools. He then takes up the scientific evidence, showing the inhibition of secretion and peristalsis and spasmodic contraction of the sphincters at the cardiac and pyloric regions, at the ileocecal junction and at the anus following emotional excitement. The experiments of Cannon are cited in his early use of bismuth meals and fluoroscopy, where he had to use old tabby cats of settled dispositions in order to secure normal peristalsis. In other animals fear, anger or discomfort stopped all movements in the stomach and bowels at once. Cutting the splanchnics and vagi will remove much of this inhibition. Numbers of instances are given where secretions are likewise stopped by emotional disturbance, as proved by analysis of gastric contents, and also examination of intestinal contents in the presence of artificial openings in the bowels. It is shown that not only psychic disturbances but muscular fatigue in normal persons will similarly inhibit digestion.

Alvarez advises that one should only eat when one is free from worry, emotion and fatigue. He cites the gaseous distention following abdominal operations, due to the absence of normal food stimulation and suggests tempting the patient with some savory morsel as the best method of starting peristalsis and secretion. The custom of giving patients a beefsteak breakfast by one of our confreres in these cases may work favorably in some cases but in most, it seems to the reviewer, peristalsis will be reversed explosively and not seldom profanely.

A brief, clear clinical description of the salient points of cholecystitis, ulcer, cancer of the stomach and colon, chronic appendicitis, diverticulitis and amebic infestation are given that these may be excluded. The author does not believe in roentgen-ray diagnosis of chronic appendicitis in absence of a history of acute attacks, neither does he make a diagnosis of amebiasis merely from the presence of a few cysts in the stools, in the absence of usual symptoms. He advises the use of stovarsol for a few days as a therapeutic rest.

Continuing the description of organic diseases that may simulate nervous indigestion, the author includes in this category hypertension, failing heart, hyper- and hypothyroidism, incipient pernicious anemia, arthritis of the spine and diseases of the urinary tract. Also gastritis, and cases masquerading as cholecystitis, ulcer and appendicitis. These latter he is unable to explain, although offering suggestions, as for instance of early cirrhosis, cholangitis or hepatitis resembling cholecystitis.

Next under consideration are fatigue, temperamental and anxiety neuroses, marital infelicity, nervous vomiting and psychopathy, about which the author makes many pithy and common sense observations. He next touches on asthenia, enteroptosis, migraine, mucous colitis, intestinal allergy, constipation and diarrhea. He attributes no significance to the presence of enteroptosis and thinks the rest cure in hospital is of benefit from rest rather than a high calory diet. It seems to the reviewer that the enteroptotic build is chiefly significant of the presence of universal asthenia and that no more brilliant results are obtained in internal medicine than by forced feeding and rest in these patients.

The author finds skin tests of little value in intestinal allergy but advises a diet of meat, rice, butter and sugar, and experimental increase following this. He favors saline enemas in many cases of constipation. Some wise remarks are made about taking history and concerning various types of nervous patients and physicians who are called to treat them. All through the book the dangers of overlooking organic disease are emphasized and the fact that nervous symptoms are often caused by long continued but undiscovered pathology. In the matter of treatment the author leans to a bland diet and sedatives, especially adalin and bromural. The treatment of constipation is most rational, the author ignoring constipation without symptoms. The autointoxication so often talked of is thought of slight significance, especially in the constipated.

Following the chapter on treatment, appears one on some practical points in relation to the physiology of digestion in which the author has been a notable experimenter. His theory of gradient of force in the bowel is explained very simply and has many practical applications. The book closes with references to the writings of well known men in respect to the handling of neurotic and sensitive patients, such as those with nervous indigestion.

The volume as a whole is not written in the didactic and dry form of the usual medical textbook but in the rather conversational style of an interesting lecturer, with many references, anecdotes and illustrations to enliven and stimulate the reader. It is particularly good as coming from a clinician of large experience and who gives us many valuable practical hints that he has picked up through failures or successes in the office or by the bedside.

WINSLOW.

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THE PATHOLOGY OF DIABETES MELLITUS. By Shields Warren, M.D., Pathologist of the New England Deaconess Hospital, Boston, etc. With a Foreword by Elliott P. Joslin, M.D. Illustrated with 83 Engravings and 2 Colored Plates. 212 pp. $3.75. Lea & Febiger, Philadelphia, 1930.

It is refreshing to find a treatise dealing with the pathology of diabetes and the author is to be congratulated on his excellent achievement of correlating strictly pathologic disease with clinical progress. This work helps one to visualize what is occurring to the diabetic individual during the progression of his life. The great stimulator of all who have an interest in this problem, Joslin, has beautifully presented this phase in the foreword when he says, "It is the pathology of and for the living almost as much as of the dead."

Everyone who is interested clinically in the management of diabetes should read this work. The material is well chosen and it is enhanced with lovely contrast. The illustrations are excellent and the bibliography is comprehensive. We will find a certain amount of stimulus in the effort which is made to divert our minds when we attempt to focus too closely upon the Islands of Langerhans while thinking of etiology. Such work as this helps to a better understanding and to a better appreciation of the gradually progressive changes which are associated with diabetes mellitus. Those definite features which are known are stated, and the way is pointed where diligent effort and thought may bring fruitful progress. A vote of thanks is due to the author and the institution which has sponsored him.

HOFRICHTER.

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OBSTETRICS. A Textbook for the Use of Students and Practitioners. By J. Whitridge Williams, Professor of Obstetrics, Johns Hopkins University, etc. Sixth Enlarged and Revised Edition. With Seventeen Plates and Seven Hundred and Thirty Illustrations in the Text. 1157 pp. $10.00. D. Appleton and Co., New York and London, 1930.

Many topics throughout this book are treated in a manner worthy of special mention. In presenting the subject of the anatomy of the uterus, recent advances in the knowledge of enervation have been added. Mention is made of the work of Segond, Cotte and others, concerning the pain-carrying nerve fibres of the pelvis. An interesting suggestion has been made by Hofbauer who describes certain fibres in the periphery of the uterine structure as being not unlike, in description and function, the well-known bundle of His in the heart. The author comments, "The presence of these bundles is unquestioned, but the establishment of their purpose needs further investigation."

The work of Allen and Doisy in isolating the follicular hormones and in their supply and standardization from placental sources has met with favorable comment. Some space has also been allotted to the discussion of the experiments which have been carried on in the permeability of the placenta to various substances. These represent some new thought upon the manner in which the embryo receives its nutrition.

An interesting addition to the contents has been made in the treatment of analgesic measures used in obstetrics. The author condemns without hesitancy the use of ethylene as an obstetric anesthetic, as well as the ever increasingly popular spinal anesthesia. He suggests that it may be useful in a very limited number of obstetric complications, but never warranted in a normal case. The work of Gellhorn in the use of local anesthesia is given some space, and while it has been successful in his hands, the author sees no reason for its general application. The technic of Gwathmey is given in detail and receives favorable comment, although the author states he is satisfied with the analgesia and amnesia secured by the administration of nitrous oxide and oxygen by inhalation and sees no reason for changing.

Mention is made of an interesting experiment originating in the author's clinic in connection with the induction of labor, where pituitrin is necessary as an adjunct to the usual oil and quinine. Pituitrin is administered to the nasal mucous membrane instead of by hypodermic injection, as described in Watson's technic. This has been effective, following the method of application as first described by Hofbauer.

The chapter on the toxemias of pregnancy has been completely rewritten and revised. Recent advances in the

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field of biochemistry and physiology have been considered in detail. The new conception of these obstetric conditions is very well given and is well worth careful study by any physician. Eclampsia is well discussed and the ever increasing conservatism seems to be making inroads upon the past severe mortality of this grave condition. The subject of contracted pelvis has been little changed in this edition. Ruble.

The Action of Muscles. Including Muscle Rest and Muscle Re-Education. By Sir Colin Mackenzie, M.D., F.R.C.S., F.R.S. (Edin.) Professor of Comparative Anatomy and Director of the Australian Institute of Anatomy, Canberra, etc. Second Edition. With One Hundred Illustrations. 288 pp. $3.50. Paul B. Hoeber, Inc., New York, 1930.

Everyone who has occasion to treat muscular paralysis should read this book. Chapters on principles are first presented. No paralyzed muscle is affected alone. Its antagonists and synergists must be equally considered. Emphasis is placed on position of an extremity with paralyzed muscles, as the employment of the airplane splint in the treatment of deltoid paralysis. The necessity of reeducation of paralyzed muscles is continually stressed. By the correct application of these principles an extremity condemned to permanent disability may be restored to usefulness. The muscles of each extremity are taken up in order and the technic described for the proper treatment. It is impressed upon the reader that the old conception of massage and electricity as the sole treatment of paralysis is insufficient for the restoration of function. Reeducation is the watchword which is dominant in the treatment of all these cases. In no other publication will one find more satisfaction and profit for the study of this line of treatment.

Intestinal Tuberculosis. Its Importance, Diagnosis and Treatment. A Study of the Secondary Ulcerative Type. By Lawrason Brown, M.D., Consultant to the Trudeau Sanatorium, Saranac Lake, N. Y., and Homer L. Sampson, Roentgenographer to the Trudeau Sanatorium. Second Edition, Thoroughly Revised. Illustrated with 122 Engravings and 2 Colored Plates. 376 pp. $4.75. Lea & Febiger, Philadelphia, 1930.

The authors began their investigation of tuberculosis of the intestine about 1915, shortly after Dr. Trudeau's death, and have ever since continued their research with patients and material furnished by the Trudeau sanatorium and the Saranac laboratory. They have placed the whole matter upon a definite, comprehensive basis, which has been or may be of inestimable srevice to every physician interested in tuberculosis. The series of chapters on pathologic anatomy of intestinal tuberculosis is epochal in character and the thorough elucidation and classification of symptoms give one the sense of assurance in dealing with the problem.

The laboratory methods and particularly the roentgen-ray work with the barium meal and the barium enema reveal the most painstaking endeavor toward scientific advance. And lastly the treatment advocated, although not novel, is instituted very much earlier than has been customary because of the new possibilities of early diagnosis, and is so logical and practical as to appeal to all men who will give this vital matter the consideration it deserves. This book should be carefully studied by every physician who undertakes the management of intestinal tuberculosis, as nothing equal to it is procurable today.

Slyfield.

Diseases of the Genitourinary System in Infancy and Childhood. Clinical Pediatrics, Vol. XIX. By Henry F. Helmholz, M.D., Professor of Pediatrics, University of Minnesota (The Mayo Foundation), etc., and Samuel Amberg, M.D., Associate Professor of Pediatrics, University of Minnesota (The Mayo Foundation), etc. Illustrated. D. Appleton and Company, New York and London, 1930.

This volume is one of a recently published series on pediatric topics, the editor of which is Dr. Royal Storrs Haynes. It was written by two of the foremost American students of urogenital diseases in early life. The opening chapters are devoted to a consideration of embryology, anatomy and physiology of the genitourinary organs. In the chapter on "Methods of Diagnosis" the latest functional tests, as well as cystoscopic technic and pyelography, are discussed. The remaining chapters cover the general subjects of urinary tract anomalies, infections and tumors. The discussion of pyogenic infections is especially instructive and authoritative, due to the fact that the coauthors have performed a large amount of experimental work in this field. Illustrations and complete bibliography are additional features of this monograph. Olmsted.

Handbook of Anatomy. Being a Complete Compend of Anatomy. By James K. Young, M.D., F.A.C.S. Late Professor of Orthopedic Graduate School of Medicine, University of Pennsylvania. Revised by George W. Miller, M.D., F.A.C.S., Assistant in Anatomy Jefferson Medical College. Seventh Revised Edition. With 154 Engravings, Some in Colors. 460 pp. $3.75. F. A. Davis Company, Philadelphia, 1930.

One frequently feels the need of a handy book on anatomy, in which he will find anatomic data concisely arranged for ready reference. This volume has been prepared to supply such a demand. The ordinary physician forgets anatomic names and the many details of the anatomic knowledge which he has accumulated in past years. A book of this sort is useful to revive one's memory. The author employs the latinized form of the Basle Nomenclature in the text together with orthodox terminology long in use. If employed alone these new words might be confusing. This is avoided by the insertion of well known designations. This volume includes a section on surgical anatomy, an da chapter on dental anatomy with numerous tables.

The Medical Clinics of North America. (Issued serially, one number every other month.) Volume 14, Number 2. (New York Number, September, 1930.) Octavo of 273 pages with 71 illustrations. Per clinic year, July 1930 to May 1931. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1930.

Many important medical topics are considered in this volume. Doan, in the discussion of the newer aids to diagnosis and prognosis in tuberculosis, considers the value of the peripheral blood count and the phosphatic precipitin test as a possible aid in diagnosis and prognosis. He discusses implications of the newer bacteriologic studies and the data to be derived from roentgen studies. Held and Goldbloom consider the pathogenesis of peptic ulcer, reviewing all of the common theories at length. They conclude that no single cause is solely responsible. The constitutional factor should be considered and certain occupations must not be overlooked as a causative factor. Many interesting cases are reported with enlightening discussions.

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# SPONTANEOUS GENERATION AND FILTERABLE VIRUSES*

T. M. Rivers, M. D.
NEW YORK CITY

In 1657, five years before the Royal Society received its charter from Charles II, the Accademia del Cimento (Society of Experiment) was organized in Florence under the auspices of Leopold. Francesco Redi was an active member of this society and, in refuting popular misconceptions, did not use arguments alone, but also employed sound experimental evidence. He conducted many different kinds of experiments. The ones concerning which I wish to speak today, however, dealt with the generation of insects. A description of this work appeared in 1668. Bigelow's English translation was published in 1909 and with Cole's essay[1] on Redi constitutes the source of my information and quotations.

The current opinion concerning the origin of insects was expressed by Redi in the following manner:

"After a long period of fertility, during which time many monstrous and marvelous generations were brought forth, the Earth Mother became at last exhausted and sterile and lost her power of producing man and the larger animals; still she retained enough vigor to bring forth (besides plants, that are presumed to be generated spontaneously) certain small creatures, such as flies, wasps, spiders, ants, scorpions and all other terrestrial and aerial insects. The schools, both ancient and modern, all agree in this, and constantly teach that the Earth has continued to produce these creatures and will produce them as long as she exists. They do not, however, agree as to the manner in which these insects are generated, nor how life is communicated to them; for they say that not only does the Earth possess this occult power, but that it is possessed by animals, living and dead, also by all things produced from the Earth, and finally by those who are about to decay and return to dust. Hence others have claimed putrefaction itself to be the all-potent cause of generation . . ."

Ideas regarding spontaneous generation held by Redi's contemporaries may be further illuminated by quoting Alexander Ross' opinion of Sir Thomas Brown's doubt as to "whether mice may be bred by putrefaction."

"So may he doubt whether in cheese and timber worms are generated; . . . or if butterflies, locusts, grasshoppers, shellfish, snails, eels and such like, be procreated of putrid matter, which is apt to receive the form of that creature, to which it is by formative power disposed. To question this is to question reason, sense and experience. If he doubts this, let him go to Egypt, and there he will find the fields swarming with mice begot of the mud of Nylus, to the great calamity of the inhabitants."

Redi traced the beginning of the idea that bees originate in carcasses of dead bulls and lions to the story of Sampson, who, as you remember, killed a lion, and later, when he had occasion to pass that way again, saw in its carcass a swarm of bees with honey. From this experience Sampson conceived the riddle that perplexed the Philistines: "Out of the eater came forth meat, and out of the strong came forth sweetness" (Judges XIV:14).

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* Lecture delivered before the Eighth Annual Meeting of Pacific Northwest Medical Association, Butte, Mont., July 1-3, 1930.

[1] Cole, Rufus: Francesco Redi (1626-1697), Ann. Med. History, 1926, viii, 347.

In spite of the general belief in spontaneous generation and in face of the sad experience of Galileo, Redi proceeded to show by experiments that worms are not spontaneously engendered in the flesh of dead animals. He accomplished this by dividing bits of fresh meat into two portions, one of which was left open to the air and insects, while the other portion was placed in a vessel with a large mouth, over which was stretched gauze that permitted the entry of air and prevented the access of insects. The meat protected by the gauze remained free of maggots, while in the unprotected portion numerous worms appeared. Many experiments of this nature were performed, and from data thus obtained, Redi concluded:

"Although content to be corrected by any one wiser than myself, if I should make erroneous statements, I shall express my belief that the Earth, after having brought forth the first plants and animals at the beginning by order of the Supreme and Omnipotent Creator, has never since produced any kind of plants or animals, either perfect or imperfect; and everything which we know in past or present time she has produced came solely from true seeds of the plants and animals themselves, which thus, through means of their own, preserve their species."

In the course of time, the theory of spontaneous generation seems to have been thoroughly discredited. The invention of the microscope, however, at the end of the seventeenth century, which enabled investigators to see bacteria, brought fresh arguments in favor of spontaneous generation, and about the middle of the eighteenth century the problem again became of interest to scientists[2]. Needham and Buffon supported the idea of spontaneous generation, while Spallanzani opposed it. Inasmuch as the arguments and experiments brought forward by these men are familiar to all, a lengthy description of them need not be given at this time. Nevertheless, it may be amusing to consider for a moment Buffon's explanation of Needham's "productive or vegetable force." According to him, "there are certain primitive and incorruptible parts common to animals and to vegetables." These incorruptible parts or molecules arrange themselves in shapes which constitute different living beings. Upon the death of these forms, the molecules are liberated and through their activity having worked the putrid material, finally appropriate to themselves new particles and form "by their reunion, a multitude of little organized bodies, of which some, like earthworms and fungi, seem to be fair-sized animals or vegetables, but of which others, in almost infinite numbers, can only be seen through the microscope."

For another century, that is to say until 1858, the theory of spontaneous generation had its good and bad moments, at which time it was brought to the front again by Pouchet in a "Note on Vegetable and Animal Proto-organisms spontaneously Generated in Artificial Air and Oxygen Gas." At this point Pasteur appeared on the scene, and, in 1860, he wrote: "I am pursuing as best I can these studies on fermentation which are of greatest interest, connected as they are with the impenetrable mystery of Life and Death. I am hoping to mark a decisive step very soon by solving, without the least confusion, the celebrated question of spontaneous generation. Already I could speak, but I want to push my experiment further. There is so much obscurity, together with so much passion, on both sides, that I shall require the accuracy of an arithmetical problem to convince my opponents by my conclusions. I intend to attain even that."

Pasteur's experiments conducted with sterile media hermetically sealed in flasks and with media stored in flasks closed by means of cotton plugs seemed at the time to overthrow completely the theory of spontaneous generation. After this he turned his attention to other problems. Thus he wrote to a friend: "What would be most desirable would be to push those studies (that is, on spontaneous generation) far enough to prepare the road for a serious research into the origin of various diseases." As is well known, he pursued the matter and subsequently made many discoveries concerning the relation of bacteria to infectious diseases.

Redi, in 1668, showed that insects do not arise spontaneously, and Pasteur, two centuries later, demonstrated that small living organisms, *e. g.*, bacteria, visible only by means of the microscope, yet capable of producing disease, do not arise *de novo*. Now we come to another interesting and tumultuous period in the development of our knowledge concerning the origin and nature of a group of active agents, producing certain kinds of diseases in all forms of animal and plant life.

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[2] Vallery-Radot; Rene, Life of Pasteur, translated by Mrs. Devonshire, Constable & Co., London, 1911.

In 1892, Iwanowski observed that the etiologic agent of mosaic disease to tobacco plants is capable of passing through earthen-ware filters impervious to bacteria. This observation was confirmed in 1898 by Beijerinck, who, unable to see anything in the infectious filtrates by means of the microscope, stated that the cause of tobacco mosaic is a living contagious fluid. Also in 1898, Loeffler and Frosch showed that the agent responsible for foot-and-mouth disease in cattle is capable of traversing bacteria-tight filters and is invisible under the microscope. In the same year Sanarelli demonstrated similar facts regarding the causative agent of an infectious tumor of rabbits. In rapid succession, many disease-producing agents were found to be filterable and invisible, and in view of these facts, many of them are now considered to be much smaller than ordinary bacteria which are themselves visible only under the microscope. Thus we come to the period signalized by a group of disease-inciting agents, to which many names have been applied, *e. g.*, filterable viruses, invisible viruses, ultraviruses, ultramicroscopic viruses, ultramicrobes, inframicrobes, protista, chlamydozoa and strongyloplasmen.

What of the nature of these active agents? In view of the fact that they undoubtedly multiply and are capable of producing diseases, most workers in the past have been led by analogy to assume that these agents represent exceedingly small types of bacteria, protozoa or spirochetes. From the very first, however, certain workers have registered protests against such assumptions. For instance, Beijerinck, as mentioned above, considered the cause of mosaic to be a living contagious fluid. Woods held it to be an enzyme. Sanfelice, in 1914, working with fowl-pox or "sorehead" of chickens, found that the causal agent was not inactivated by 1 per cent sodium hydroxide, and, because of this fact, was led to think of it as an inanimate poison capable of attacking normal cells and of inciting in them the production of a poison of a similar nature which in turn could attack other normal cells. Thus he described his idea of how a lifeless agent might be passed in series reproducing itself indefinitely.

From 1898 till 1915, with a few exceptions, investigators considered the filterable viruses to be small living organisms. Furthermore, a host of workers claimed that they could see and cultivate them on simple artificial media. These claims, however, have not been substantiated. Then came the work of Twort and d'Herelle on the transmissible lysis of bacteria or bacteriophagy. Both of these men consider this phenomenon as an acute infectious disease of bacteria. Twort speaks of the agent as belonging "somewhere in the vast field of life more lowly organized than the bacterium or amoeba" and suggests that "it may be living protoplasm that forms no definite individuals, or an enzyme with power of growth," or finally, a material arising spontaneously in normal bacteria. d'Herelle's work followed Twort's by two years. This investigator firmly believes that the bacteriophage is a living agent and speaks of it in the following manner: "The protobe, then, penetrates the peripheral zone of the bacterium and multiplies within the bacterial protoplasm, forming a colony composed of a number of elements varying with the conditions of the moment. When process of multiplication is completed, the parasitized bacterium ruptures and undergoes a sudden dissolution. This liberates the young protobes and each of the latter is then ready to repeat the process and parasitize the nearest bacterium. Thus the cycle begins anew, and continues until all the bacteria present in the medium have disappeared."

Other workers have taken up the problem and numerous ideas concerning the bacteriophage now exist. Bordet does not believe that it is a living autonomous agent. Bail considers that the phenomenon of bacteriophagy is due to the fact that bacterial chromosomes lose their anabolic function. Thus, cells with chromosomes possessing only the function of katabolism undergo dissolution, liberating the imperfect chromosomes which are then capable of initiating similar vitiation in other bacteria. A number of workers consider that they have been able to demonstrate that the phage arises from normal bacteria. Nevertheless, Bronfenbrenner, an ardent advocate of the idea that the agent of transmissible lysis of bacteria is a bacterial product, believes that "the reports concerning the successful production of phage from bacteria without the intermediary of other biologic materials have thus far not been entirely convincing."

How is a strain of bacteriophage obtained? The following method is usually employed. Take feces, sewage or certain organs of dead or living animals, emulsify them well, add meat infusion broth, allow the mixtures to stand at 37 degrees C. for twenty-four hours, filter first through sand and then through a Berkefeld candle. The limpid filtrate thus secured is free from ordinary bacteria but frequently contains a bacteriophage that is capable of inciting the dissolution of living susceptible bacteria and of reproducing itself indefinitely in the presence of such living susceptible organisms.

Can one see the bacteriophage? d'Herelle says that it is visible. Others, however, contend that he sees only the particles of degraded bacteria on which the active agent is absorbed. In any event, the bacteriophage is exceedingly small, probably not more than 5 to 20 $\mu\mu$ in diameter—a $\mu\mu$ represents the millionth part of a millimeter. An object of this magnitude cannot be measured optically. Is it possible that an agent of such small size possesses life? Who knows? One can safely say, however, that the bacteriophage and certain protein molecules are of the same order of magnitude, for example, the diameter of egg albumin is 4 or 5 $\mu\mu$, while that of hemoglobin is approximately 30 $\mu\mu$.

In view of these facts, one naturally would like to know whether the bacteriophage maintains a metabolism of its own? According to d'Herelle, it has powers of assimilation, but most workers agree that no evidence of respiration or of other metabolic activities has been definitely proved for this peculiar agent. All agree, however, that it possesses a remarkable power of regeneration in the presence of susceptible bacteria. Is it alive? Some contend that it is an inanimate agent, while others believe it to be a living autonomous organism.

Although d'Herelle is convinced that the bacteriophage is a living autonomous organism, he has been forced to discard the idea that the cell is the unit of life and speaks of the matter in relation to the viruses in the following manner:

"For many years we have spoken of ultraviruses and we will see that these beings can only be constituted of a simple colloidal micella. But these beings are necessarily alive for they possess all of the characteristics of living organisms . . . To state that a substance which possesses all of the characteristics of living beings . . . cannot be a living being is incomprehensible nonsense.

"A being composed of a micella cannot be a cellular being, and as a consequence the cellular concept of life is necessarily false for it fails to take into consideration the facts of the case. It is thus necessary to revise the theory to provide an hypothesis which conforms to the facts, that is, that life, the sum total of the powers of assimilation and of adaptation, is the result, not of a cellular organism, but of a special physicochemical constitution of matter."

Thus d'Herelle speaks as though the question was settled, but others are not so positive in their statements concerning life. For instance, Henry Fairfield Osborn voices the idea of many students when at the close of his book, "The Origin and Evolution of Life," he says:

"The difference between the non-living world and the living world seems like a vast chasm when we think of a very high organism like man . . . But the difference between primordial earth, water and atmosphere and the lowliest known organisms which secure their energy directly from simple chemical compounds is not so vast a chasm that we need despair of bridging it some day by solving at least one problem as to the actual nature of life, namely, whether it is solely physicochemical in its energies, or whether it includes a *plus* energy or element which may have distinguished LIFE from the beginning."

The various conceptions concerning the nature of life are interesting, but who can definitely prove that a micella composed of promicellar granules constitutes the unit of life, and that life itself is the result of a special physicochemical constitution of matter? Furthermore, in the light of our present knowledge, the possibility that the unit of autonomous life is smaller than the cell must be looked upon as an interesting hypothesis rather than as a proved fact. Therefore, d'Herelle's arguments that the bacteriophage and other viruses are living organisms are supported by premises that, for the moment at least, are incompatible with experimental proof, and, in this respect, do not differ from those used by his opponents to show that such agents are inanimate.

Some of the original ideas regarding the nature of the mosaic viruses have already been mentioned. At this point, however, a few words concerning recent work on the nature of these agents may not be out of order. For instance, the virus particles of tobacco mosaic as they exist in plant sap have been estimated to have a diameter of 30 $\mu\mu$. Tests, however, in which purified virus is used may demonstrate that the agent is considerably smaller than is indicated by this figure. In any event, the bacteriophage and the virus of tobacco mosaic are of the same order of magnitude. Moreover, as in the case of the bacteriophage, some workers have reported that they were able by certain procedures to obtain mosaic virus from normal plants, for example, potatoes. These reports have been discredited by subsequent work establishing the fact that many normal looking plants are virus carriers. Several years ago, Olitsky reported that he was able to cultivate the virus of tobacco mosaic in cell-free media. Other workers, however, have been unable to obtain similar results. Furthermore, Vinson by means of repeated precipitations, has obtained a crystalline substance very active in producing mosaic. Although he does not consider his preparation pure, he is inclined to believe that the virus, in spite of its powers of regeneration, represents a chemical or autocatalytic agent rather than a living organism.

Now let us turn for a moment to a consideration of another filterable virus—the agent that causes certain chicken tumors. In 1911, Rous showed that some malignant tumors of fowls are transmissible indefinitely in series by an agent separable from the tumor cells. These observations have led to discussions as perplexing as those described above in connection with the bacteriophage.

Rous is prepared to entertain the idea that the virus causing these tumors is animate. Moreover, Gye contends that he is able to cultivate the virus in artificial media and that it is visible by means of the ultramicroscope. Gye's contentions, however, have not been generally substantiated. Furthermore, Murphy thinks that the tumor-producing agent is an enzyme-like material, and Carrel and Fischer are of the opinion that the virus is an inanimate substance derived from injured cells capable of regenerating itself indefinitely through its successive action upon normal cells. What is the evidence supplied by Murphy, Carrel and Fischer in favor of their conceptions? The best manner of presenting this evidence is to describe their methods of making viruses or of inducing them to come into existence.

The following is Carrel's method: Take a chick embryo, mince it well, mix it with a preparation of tar, indol or arsenic, inject the mixture in a large number of chickens. In a small percentage of the fowls treated in this manner, a tumor, resembling Rous sarcoma No. 1 and transmissible by cell-free filtrates, will appear.

Fischer's formula for obtaining a virus from normal cells is: Take actively growing cells in tissue cultures, add to them in several successive generations a small amount of arsenic, carry the cultures through three or four generations after the arsenic treatments have been discontinued, then inject the cultures into chickens. On one occasion he obtained a malignant tumor transmissible by cell-free filtrates. Carrel, using tissue cultures, has been unable to confirm Fischer's work.

The details of Murphy's method are lacking, as a description of the completed work has not yet appeared. In a general way, however, the following procedure is the one used by him: Take gonads from several normal-appearing Plymouth Rock roosters, under the proper conditions make an extract from them, thoroughly centrifuge this material, concentrate the tumor-forming agent from the supernatant fluid either by precipitation with a weak acid or by electroultrafiltration, dissolve the precipitate with a weak alkali, and then inject the resulting solution into a number of chickens. In certain instances, malignant tumors, some of which are transmissible, develop in fowls receiving this material.

The observations described above are suggestive, and, if confirmed and finally interpreted by others, as they have been by Carrel, Fischer and Murphy, will prove to be of fundamental biologic significance. Unfortunately, however, a number of the tumors produced under such conditions are similar to, if not identical with, Rous' sarcoma No. 1. Furthermore, these workers have not excluded the possibility of the presence of a latent virus or of a small amount of virus in the so-called normal embryos, gonads and chickens that was brought to light under experimental conditions. This possibility is emphasized by Flexner's work on poliomyelitis, in which, using methods of concentration, he was able to demonstrate the presence of virus in the nasal washings from normal contacts. Such a possibility is further emphasized by my own experience with Virus III in rabbits, by Cole and Kuttner's work with the salivary-gland virus in guinea pigs and by the work upon virus carriers in general among animals, plants and bacteria.

From what has been said regarding certain of the filterable viruses, it is now evident why spontaneous generation was considered earlier in the talk. Slowly, scientists have been descending the scale of life as regards size, and at each step have settled to their satisfaction the question of spontaneous generation. Now we are face to face with the "infinitely small in biology." Although no investigator working in the virus field has claimed to have generated living organisms from inanimate matter, a few have stated that they have by certain manipulations induced inanimate substances to take on some of the attributes of life, for example, specific activities and the power of multiplication or regeneration. The language used and the formulae employed at the present time by many virus workers would interest combatants of former times who struggled over the problem of spontaneous generation. The nature of the viruses is still an open question. Nor is it essential that all be alike. If there be a sharp demarcation between life and death, then, scientists, investigating the nature of filterable viruses, are in the vicinity of the elusive line that separates infinitely small animate organisms from inanimate active agents.

Such a statement is strongly reminiscent of a remark by Aristotle, to the effect that "nature makes so gradual a transition from the inanimate to the animate kingdom, that the boundary lines which separate them are indistinct and doubtful." This remark emanated from the father of biology more than two thousand years ago, but its echo has spanned the intervening ages and can now be easily recognized in Boycott's presidential address, "The Transition from Live to Dead: the Nature of Filtrable Viruses," given in 1928 before the Pathological Section of the Royal Society of Medicine. In this discourse Boycott expressed the following opinion: "If you like to be paradoxical, you can say that live things are dead, or if you prefer it, that dead things are alive. Both at bottom have much the same characters, and it is unlikely that any sharp distinction between them can be drawn."

Aside from theoretical considerations, of what importance are the filtrable viruses? Although the nature of these agents is perplexing, there is no doubt about what they can do, or about the importance of their activities. Indeed, if it were not for the pathologic changes produced by the viruses in some host, their existence would at present be unknown. All visible forms of plant and animal life are attacked by these agents, and the following are a few of the diseases resulting from their activities: Bacteriophagy, or transmissible lysis of bacteria, mosaic diseases of plants of which there are at least 90, polyhedral diseases of caterpillars including the silkworm, lymphocystic disease of fish, Rous' sarcoma of chickens, fowl-pox or "sorehead" of chickens, fowl plague, infectious myxomatosis of rabbits, distemper of dogs, rabies or hydrophobia, cattle plague, foot-and-mouth disease of cattle, hog cholera, Borna disease or meningoencephalitis of horses, cow-pox or vaccinia, smallpox, chickenpox or varicella, fever blisters, measles, yellow fever, and poliomyelitis or infantile paralysis. One cannot consider this array of diseases without realizing their economic importance, nor can one fail to see how drastically they may influence the physical well-being of all forms of life.

Concerning the virus diseases, certain outstanding facts are worthy of notice. Their incitants are spoken of as filterable viruses because they traverse various kinds of filters that do not permit the passage of ordinary bacteria. No one has definitely shown that the etiologic agents of virus maladies are visible by means of the best microscopes. The conception that viruses either constitute filterable forms of ordinary bacteria or represent a small form in the life cycle of bacteria is untenable. In spite of many reports to the contrary, none of the viruses has been cultivated *in vitro* in the absence of living susceptible host cells. Thus they appear to be obligate parasites in the sense that living host cells are essential for their multiplication. They exhibit an intimate type of parasitism which at times is highly specific, that is, many are capable of multiplying and producing lesions in only one species of host. The intimate type of parasitism is further emphasized by the marked stimulation and destruction of cells, which on the one hand gives rise to tumors, such as Rous' sarcoma, and on the other hand to vesicular lesions, as in varicella. Moreover, the effects upon cells resulting from the activity of viruses are frequently evidenced by the appearance either in the nucleus or in the cytoplasm of characteristic structures, spoken of as inclusion bodies. Such bodies are not found in ordinary bacterial diseases, nor have they been described in all virus diseases. Finally, a host once recovered from a virus disease, with a few exceptions, usually exhibits a lasting immunity.

If the viruses are invisible or at least are not capable of being recognized by means of the microscope, and if they continue to resist cultivation on lifeless media in test tubes, one may inquire as to how investigators intend to conduct studies concerning them. Individuals limiting their investigations to test tubes in the hope of obtaining knowledge regarding these agents and the diseases caused by them will certainly at the present time commit errors and meet with many disappointments. Since viruses can be recognized and identified only by their activities in natural or experimental hosts, workers in the virus field must be clinicians and pathologists, as well as bacteriologists and immunologists. Furthermore, in addition to being familiar with the gross and the ordinary microscopic pathology of these diseases, one should be thoroughly acquainted with the intracellular pathology as expressed in the form of incision bodies. These structures, for example, as in hydrophobia, smallpox, vaccinia and polyhedral diseases of caterpillars, are of diagnostic importance and serve as a substantial aid in experimental work.

In spite of obvious difficulties associated with all virus work, certain facilities and methods either are already at hand or are being rapidly developed for the purification, concentration and preservation of viruses, for investigations regarding the size and nature of viruses, for determinations concerning their relation to susceptible and nonsusceptible cells and, finally, for studies relating to basic immune phenomena. For instance, various methods of filtration, dialysis, diffusion, cataphoresis, electroultrafiltration and tissue cultures are being adapted to work in this field.

In conclusion, the virus field at present offers many alluring problems to investigators interested either in the nature of life or in the phenomena associated with infectious diseases. The nature of the viruses may evade solution for a long time, and it may never be possible to see and to cultivate many of these disease-producing agents on artificial lifeless media. Such possibilities, however, should not induce an undue amount of pessimism, because, as knowledge increases concerning the viruses, their activities and their modes of spread, methods of prevention will become more effective. This fact is beautifully exemplified by Laidlaw and Dunkin's works dealing with canine distemper and by the discoveries of Stokes and his coworkers concerning yellow fever in West Africa.

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# SOME PHARMACOLOGIC ASPECTS OF PREANESTHETIC MEDICATION *

Chauncey D. Leake, Ph.D.
SAN FRANCISCO, CALIF.

Thanks to efficient anesthesia and asepsis during the last half century, surgical patients no longer fear the operation, having learned meanwhile to trust the skill of the surgeon. With the greater fear removed, however, they are still generally afraid of the lesser evil, the administration of the anesthetic. Much interest has thus developed among those unsung humanitarians, the anesthetists, in devising ways by which a patient may quietly, without apprehension and often unsuspectedly, be induced into the desired anesthetic state.

Proper psychic preparation of a surgical patient, by an anesthetist who appreciates something of the psychology of fear and of the means by which the dread of a surgical operation may be minimized, will do much to improve such a patient's general status before the actual anesthetic is administered. But in the average patient, where time is not always available for this procedure, a suitable preanesthetic hypnotic may be necessary to supplement the anesthetists's psychic approach. A preanesthetic hypnotic, however, is not indicated solely for the relief of fear the patient may have for anesthesia; it has a definite function in the actual induction and conduct of the anesthesia. As pointed out so strikingly by Waters and Guedel,[1] a preanesthetic hypnotic is most useful in lowering the patient's general metabolic level to a point where the anesthetic may be easily and smoothly administered.

Preanesthetic hypnosis certainly reduces the amount of anesthetic agent required, so that during the direct anesthesia more oxygen may be given than would otherwise be the case, were no preliminary depressant agent employed. Thus with proper preanesthetic preparation a satisfactory degree of surgical anesthesia may be readily secured by nitrous-oxide to a dangerous asphyxial concentration which is frequently necessary without supplementary depression. The safety and ease of rapid and accurate control of anesthesia by means of nitrous-oxide and oxygen renders this combination the most satisfactory now available, when used with proper preanesthetic hypnosis.

## MORPHINE, HYOSCINE (SCOPOLAMINE) AND CODEINE

Although much general dissatisfaction has been expressed with morphine and hyoscine (scopolamine) as *preanesthetic hypnotics,* they continue to be used quite routinely in the absence of any pressing clinical necessity for something better. Morphine is definitely indicated, of course, as a *preanesthetic analgesic* when pain is present. A consideration of the pharmacology of these agents may be of interest in supporting the independent clinical condemnation of these agents for *preanesthetic hypnosis* years ago by such competent observers as Herb, Gatch and Bevan.[2]

The primary effect of morphine is stimulation of the central nervous system, which is promptly masked in humans by a secondary depression. *The stimulating action outlasts the depression.* Thus, after the depression wears off there is increased irritability and cortical excitement, which may be responsible for the initiation of craving and habit. That is, during the after-period of irritability the individual craves the drug again in order to recover the pleasant euphoria of the depressant stage.[3] Another objection to morphine as an adjunct to anesthesia is its tendency to cause constipation, which interferes with a proper postanesthetic condition. Furthermore, morphine is not helpful in anesthesia because its action in depressing respiration interferes with the rapidity of absorption or elimination of an inhalation anesthetic. To these three important pharmacologic objections might be added its tendency to disturb carbohydrate metabolism, in a manner not conducive to the best condition of the patient, as reflected in its effect on blood sugar and on the acid-base balance of the blood.[4] In justice to morphine, however, it should be noted that the clinical opinion that it interferes with kidney function has little support when critically examined.[5] The suppression of renal activity under anesthesia seems to be a reflex effect of irritation of the laryngeal mucous membrane by the anesthetic gases.[6]

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* Revised from addresses delivered before the Eighth Annual Meeting of Pacific Northwest Medical Association, Butte, Mont., July 1-3, 1930, and the Forty-first Annual Meeting of Washington State Medical Association, Mount Baker Park, Wash., Sept. 2-3, 1930.

Little rational evidence exists that opium or a mixture of its alkaloids free from nonalkaloidal material ("pantopon") has any advantage over morphine as a preanesthetic hypnotic. Such a mixture of the differently acting alkaloids in opium is an irrational material to use, since not only aggravation of some of the deleterious effects of morphine, as its constipating action, is known to occur by giving it with other opium alkaloids, but indeed few of these other alkaloids have been properly studied either pharmacologically or clinically to know how they may act. Scientific therapy demands the use of chemical agents singly for definite effects, avoiding confusing mixtures of any sort. Certainly preanesthetic hypnosis should be simplified and rationalized rather than complicated.

Hyoscine or scopolamine is said to synergize with morphine, enhancing its depressant action, especially on the cortex. The pharmacology of hyoscine has not been very thoroughly studied and there seem to be few clinical observations of a critical nature on the effects of this drug in connection with anesthesia. Hyoscine is chemically related to atropine and has a similar effect on the autonomic nervous system. This action, as we shall see, may be detrimental in preanesthetic medication. In the absence of any reliable or critical evidence of its usefulness as a preanesthetic hypnotic, little justification exists for its continued use merely because of clinical habit or routine. There is an opportunity here for clinical judgment to evaluate critically its status as an adjunct to anesthesia.

In the effort to find other more satisfactory preanesthetic hypnotics which might be substituted for morphine, a number of other substances were studied in my laboratory from the point of view of their effects on the body functions of normal human subjects, in comparison with morphine.[7] We studied especially the action of these various depressant drugs on basal metabolic rate, tactile discrimination, respiration, pulse rate and blood presssure. We thought our observation might furnish us with objective quantitative criteria for estimating depressant action of the different drugs on the central nervous system. While codeine has much to recommend it over morphine as a central nervous system depressant, it is not sufficiently powerful, in our judgment, to justify its use clinically for preanesthetic hypnosis.[8]

### BARBITAL AND ITS DERIVATIVES

The exploitation of sodium amytal suggested that we study barbital and its common derivatives from this standpoint. *As a result of our observations on normal humans we may recommend barbital by mouth as a possible substitute for morphine as a preanesthetic hypnotic if no pain is present.* In the average adult it may be expected to bring relief from fear and apprehension, and to dispose toward sleep, relaxation and amnesia, in doses of 1.0 to 1.5 grams or even higher. It depresses the basal metabolic rate in the same way as morphine, and is otherwise generally depressing. No residual stimulation results, and the psychic disadvantage of hypodermic administration is avoided. It may sometimes cause a cutaneous rash, however, and it is of no use as a hypnotic if pain is present. Subjective reactions to barbital vary greatly with physical constitution and social background. If the ordinary local anesthetics are to be used, it is definitely indicated since it protects against their toxic manifestations.[9] With spinal anesthesia, the status of which still remains to be established, more of an analgesic effect is needed in the preanesthetic medication, and morphine or amidopyrine is indicated.

We could not find that phenobarbital, or any of the common commercial modifications of barbital, including "amytal," "dial," "ipral," "neonal" and "phanodorn," have any significant advantages over barbital as hypnotic agents in man. Indeed, they all showed some disadvantages.[10] Eddy, however, from animal experiments believes "amytal" has the greatest depressing effect (Table 1).[11]

It is sometimes amusing to the pharmacologist to observe the enthusiasm with which certain clinicians continue to report experiences with new drugs. There seem to be fads and styles with drugs

TABLE I.

Comparison of the Average Effects of Certain Depressant Drugs Given by Mouth on Basal Metabolic Rate, and Other Body Functions as Determined by Experiments on Normal Human Subjects.

| DRUG | NO. OF EXPERIMENTS | DOSE RANGE MGM. KG. | EFFECT ON B.M.R. | EFFECT ON TACTILE DISCRIM. | EFFECT ON RESPIR. RATE | EFFECT ON PULSE RATE | EFFECT ON BLOOD PRESSURE | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Morphine Sulphate | 12 | 0.1 to 0.5 | — — | — — | — | + | — | No nausea. Sleep with high doses. |
| Codeine Phosphate | 10 | 0.2 to 1.0 | — | — | + | — | 0 | Tendency to sleep with high doses. |
| Amytal | 9 | 2.8 to 10 | + | — | + | Inconstant | + | Allergic reaction. Sleep in high doses. |
| Barbital | 5 | 5.0 to 20 | — | — — | + | — — | — | Caused sleep without side actions. |
| Dial | 5 | 2.8 to 7.0 | 0 | — | + | + | — | Vertigo; no sleep. |
| Ipral | 5 | 1.7 to 7.0 | — | —? | + | — | + | Vertigo; sleep with high doses. |
| Neonal | 5 | 2.9 to 6.0 | — | — | + | — | 0 | Vertigo; sleep in high doses. |
| Phanodorn | 5 | 3.3 to 8.3 | — | —? | + | Inconstant | Inconstant | Vertigo, nausea, no sleep. |
| Phenobarbital | 6 | 2.9 to 8.0 | + | — | — | — | Inconstant | Allergic reactions. Sleep in high doses. |

as with clothes. If medical men generally realized the extent to which preliminary and unconfirmed pharmacologic evidence is distorted by drug concerns (usually foreign) for clinical exploitation of new agents, they would undoubtedly be more reserved in expressing clinical opinions. Very few new drugs reach clinical trial in an ideal scientific manner.[12]

Sodium amytal was thus overenthusiastically recommended as a general anesthetic, when given in strongly alkaline solution by vein. While the induction of sleep and amnesia is dramatic by this technic, it is obvious that the agent is not in itself sufficiently analgesic to be a satisfactory general anesthetic except in dangerous doses. There is too narrow a margin of safety between the dose causing real anesthesia and that depressing the medullary centers to a lethal level. Sodium amytal thus falls in the class of anesthetic adjuncts, as now admitted by its original proponent.[13] The intravenous or even oral use of this substance as a routine preanesthetic hypnotic is not justified until it has been more thoroughly evaluated in comparison with what, in our opinion, is as satisfactory, and certainly a less expensive official drug, barbital.

Stormount et all[14] have directly studied the preanesthetic value of various barbitals in nitrous-oxide and oxygen anesthesia in rats. They found that 85 per cent nitrous-oxide with 15 per cent oxygen (enough to prevent anoxemia at sea-level) will anesthetize with 30 per cent of the average lethal dose of "dial" and "neonal," but that 45 per cent of the average lethal dose of "amytal," barbital, and phenobarbital is required to give this same effect. In man, however, we found barbital the most satisfactory depressant of the series, insofar as lowering of the basal metabolic rate, dulling of tactile discrimination, and tending toward sleep are concerned. Amytal and phenobarbital we noted increased the basal metabolic rate except in high doses. The relative merits of the several derivatives of barbital as preanesthetic hypnotics remain, therefore, to be further valuated before surgeons are justified in using any of its modifications in preference to the well studied parent substance, barbital, for this purpose.

It is hardly possible that any of the other multitudinous commercial derivatives of urea (Table II) exploited so vigorously, especially by the Germans, have any great advantage over barbital in this regard. One of these, "pernocton,"[15] includes bromine, which introduces another difficult depressant factor to evaluate.

Particularly to be condemned are combinations of barbital or its derivatives in fixed proportions with amidopyrine, such as "allonal," "cibalgin" or "pyraminal." Aside from the violation of rational therapy by such mixtures of a hypnotic with an analgesic in fixed proportions without regard to the indications of the individual patient, as scored by the Council on Pharmacy and Chemistry,[16] Koppanyi and Lieberson have shown[17] that the analgesic component of such mixtures is eliminated much more rapidly than the hypnotic, so that

TABLE II.

The urea hypnotic "racket": Some commercialized urea derivatives exploited as hypnotics. Notethose admitted to the U. S. Pharmacopeia X, and to New and Nonofficial Remedies. Avoid trade-marked names for pharmacopeial preparations.

| NAME | CHEMICAL CONSTITITUON | OWNER OF TRADE-MARK |
|---|---|---|
| "Adalin" NNR | Same as *Carbromal* USPX | Winthrop |
| "Aleudrin" | Dichlor isopropyl urethane | ? |
| "Allonal" | Mixture of allyl isopropyl barbituric acid and amidopyrine | Hoffman-LaRoche |
| "Amytal" NNR | Iso-amyl ethyl barbituric acid | Lilly |
| *Barbital* USPX | Di-ethyl barbituric acid | Public |
| "Bromural NNR" | Bromo isovaleryl urea | Bilhuber |
| *Carbromal* USPX | Bromo di-ethyl acetyl urea | Public |
| "Cibalgin" | Mixture of di-allyl barbituric acid and amidopyrine | Ciba |
| "Dial" NNR | Di-allyl barbituric acid | Ciba |
| "Fantan" | Mixture of ethyl urethane and cincpohen | Merck |
| "Hedonal" | Methyl propyl carbinol urethane | F. Bayer |
| "Ipral" NNR | Calcium ethyl isopropyl barbiturate | Squibb |
| "Luminal" NNR | Same as *Phenobarbital* USPX | Winthrop |
| "Medinal" | Same as *Sodium Barbital* USPX | Schering & Glatz |
| "Neonal" NNR | N-butyl ethyl barbituric acid | Abbott |
| "Novonal" | Di-ethyl allyl acetamide | I. G. Farbenindustrie |
| "Nirvanol" | Ethyl phenyl hydantoin | ? |
| "Paranoval" | Same as *Sodium Barbital* USPX | ? |
| "Pernocton" | Sodium butyl bromo allyl barbituric acid | ? |
| "Phanodorn" NNR | Cyclo-hexenyl barbituric acid | Winthrop |
| *Phenobarbital* USPX | Phenyl ethyl barbituric acid | Public |
| "Proponal" | Di-propyl barbituric acid | ? |
| "Pyraminal" | Mixture of barbituric acid and amidopyrine ("pyramidon") | Winthrop |
| "Sedormid" | Allyl isopropyl acetyl carbamide | Roche |
| "Somnifen" | Mixture of di-ethyl amino barbital and isopropyl propenyl barbituric acid | ? |
| "Veronal" | Same as *Barbital* USPX | Winthrop |
| "Voluntal" | Trichlor ethyl urethane | ? |

grave danger of the cumulative effect of the latter is present, if the dose is repeated to get continued analgesic action.

### TRIBROM-ETHYL-ALCOHOL

The same general considerations hold for tribrom-ethyl-alcohol ("avertin"). Enthusiastically advocated as a general anesthetic by those who hitherto rarely saw good modern anesthesia by gas and oxygen, more critical clinical opinion now recognizes this agent more properly as merely an adjunct to anesthesia.[18] The difficulties of preparation, the dangers of toxic decomposition, the necessary mode of administration and the pharmacologic action of the drug limit its usefulness, as in the case of sodium amytal by vein, to abnormally apprehensive or excited patients, and then in doses not so high as to give partial analgesia with dangerous depression of the vital centers, that is, not much more than 75 mgms. per kilo body weight.

The prolonged action of tribrom-ethyl-alcohol and of the barbitals, especially sodium amytal by vein, may have a useful postoperative effect in keeping the patient quiet and asleep. But often with the barbitals motor excitement may supervene, especially if large doses are used, and contrariwise, if the dose is too high, such severe depression may result that constant attention is needed to prevent accidental asphyxiation or other complications.

### MAGNESIUM SULPATE

The central nervous system depressant action of magnesium sulphate and its dramatic antagonism by calcium chloride was demonstrated experimentally by Meltzer and Auer[19] in 1908. Clinically developed by Gwathmey[20] for aid in preanesthetic hypnosis, its possible field of service has become somewhat neglected in the undignified rush to help exploit the newer commercialized drugs. The characteristic feature of its action is depression of motor tone and activity, so that it would seem to be especially indicated in patients with motor excitement or with so much muscular tone as to interfere with satisfactory surgery. One or two c.c. of a 50 per cent sterile solution injected intramuscularly is an average dose for this effect. It is claimed that the drug synergizes with morphine and the general anesthetics so that care must be observed in its use with these agents.

### ATROPINE

Atropine was introduced as an adjunct to chloroform anesthesia, in order to prevent reflex stoppage of the heart during the induction stage by paralyzing the peripheral endings of the vagi. With ether anesthesia it is advocated on the basis of preventing the "mucous inundation" caused by the irritant action of ether vapor on bronchial mucous membranes, and of suppressing salivation. With modern gas-oxygen anesthesia, especially when the excellent rebreathing technic devised by Waters is used,[21] in which every aspect tends so nicely to conserve the physiologic balance of the patient, these excuses for the use of atropine do not exist. This drug should certainly not be used routinely.

Osborne points out[22] that it is not good practice from the standpoint of physiology to interfere with the protective function of bronchial secretion, as long as a satisfactory cough reflex is present to prevent the formation of mucous plugs with the danger of resulting atelectasis. The bronchial and intestinal relaxation induced by atropine cannot be considered beneficial to the postoperative condition of the patient. Atropine further tends to cause some cortical stimulation, and surely the dryness of the mouth it causes is no joy to the patient already thirsty in the usual postoperative state. Atropine in my opinion, therefore, should be reserved for use when specially indicated, as in chloroform or extensive ether anesthesia, or when there is reason to expect an embarrassing mucous or salivary secretion during the operation.

## SUMMARY

To summarize this pharmacologic view of preanesthetic hypnosis, it seems that a little housecleaning is in order. Routine preanesthetic medication is strongly condemned. So also is scored an undignified rush to aid the clinical exploitation of new commercial agents not yet properly evaluated pharmacologically. Each patient should be separately considered from the standpoint of preanesthetic hypnosis with regard to type of chemical agent to be employed, if necessary at all, dosage and mode of administration. The clinical evaluation of new agents should be left to university or research hospitals, where critical study with proper control methods are most likely to be found.

When pain is present, morphine or one of the synthetic analgesics, such as amidopyrine, is indicated as the proper preanesthetic hypnotic. Hyoscine should receive more critical clinical study before its general use can be justified. If no pain is present, proper psychic approach by a skilled anesthetist may satisfactorily remove the average patient's dread of taking an anesthetic. On limited pharmacologic and clinical evidence, barbital by mouth may be suggested as a suitable preanesthetic hypnotic, if psychic approach is ineffectual. There is little indication that any of the numerous commercialized modifications of barbital are superior to the official parent substance in this respect. In certain abnormally fearful or excited patients, or when oral administration is contraindicated, a 3 per cent solution of tribrom-ethyl-alcohol, not heated above 40° C., and in doses of about 75 mgms. per kilo body weight, or sodium amytal in 10 per cent alkaline solution (pH 9.6) by vein, may be useful in conservative dosage.

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ROENTGENOLOGY OF UPPER RESPIRATORY TRACT. Henry K. Pancoast, Philadelphia (*Journal A.M.A.*, Nov. 1, 1930), says that the portion of the upper respiratory tract in the neck has been a neglected field for roentgenologic study. He says that practically all pathologic conditions of the larynx and neuromuscular disturbances present some recognizable phenomena or abnormal appearances, many of which are characteristic. The examination must be both fluoroscopic, for studying moving parts, and roengenographic, for purposes of record and finer details. The study of phonation and the swallowing act is essential in all cases. He describes both of these functions.

# UNDULANT FEVER

## A SEROLOGIC SURVEY*

CARL E. WALLACE, B.S.
TACOMA, WASH.

The number of recognized cases of undulant fever is increasing each year, and in those sections where the increase has been greatest, it has been noted that one or more investigators have conducted a systematic search for unrecognized cases. This investigative work, both from the medical and veterinary side of the subject, has brought to our attention that undulant fever can no longer be regarded as a disease occurring only in the Mediterranean Basin. It apparently is present in every community. These facts prompted this serologic survey.

In 1887, Colonel Bruce[1] of the British Army, studying this fever in the Island of Malta, isolated a small organism from the spleen and blood of soldiers suffering from Malta fever and reproduced the disease in monkeys. He named this organism micrococcus melitensis. Ten years later, in 1897, Bang[2] in Denmark discovered the bacillus causing contagious abortion in cattle. He designated this organism bacillus abortus. For twenty years bacteriologists regarded these two organisms as being entirely unrelated.

In 1918, Alice Evans[3] proved that they were morphologically, culturally and biochemically identical, and serologically very closely related. With this discovery Evans paved the way for the addition of another disease to the rapidly increasing list of diseases that man contracts from animals. In 1924[4] she suggested the possibility of cattle being the source of undulant fever. As early as 1913, Larson and Sedgwick[5] had entertained the same possibility. Keefer[6] in 1924 reported the first definitely proved case of undulant fever caused by brucella abortus.

In 1927, Evans[7] compiled reports of twenty cases of undulant fever contracted from hogs and cattle. Carpenter[8] produced abortions in pregnant heifers with organisms isolated from patients suffering from undulant fever. This work has been confirmed by other investigators.

In the State of Washington, Belyea[9] in 1927 reported a case of undulant fever occurring in a woman. This was perhaps the first case reported from this state. Bellinger and Levin[10] in 1929 reported an outbreak of undulant fever in the Oregon State Tuberculosis Hospital. Jasper[11] in 1929 reported a case terminating fatally in the same state.

Bruce named the organism isolated by him micrococcus melitensis. Bang designated his organism as bacillus abortus. In 1920 Meyer, Shaw and Fleishner[12] proposed the name brucella for this group and this classification is now generally adopted.

Evans[13] has shown that there are at least seven serologic groups into which these organisms can be divided. However, from our standpoint only two of these are of immediate interest: brucella melitensis, variety melitensis causing the infection in goats, and brucella melitensis, variety abortus causing contagious abortion in cattle. Under variety abortus is included the porcine strain.

The following are the number of cases reported in the United States for the last eight years:

| 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 2 | 8 | 42 | 206 | 649 | 1301 |

The State of Washington had one case reported prior to 1928, two during 1928 and twenty-two during 1929. For this state, at least, these figures are far from accurate; the same probably applies to many other states. Although undulant fever is a reportable disease in our state, it is certain that only a very small percentage of the recognized cases ever find their way into the official records.

Giordano and Ableson[14] in 1929 examined 1100 specimens of blood for the presence of agglutinins specific for the brucella group. Agglutinations occurred in sixty-three. Ten of these cases were in a sanitarium for tuberculosis. In fourteen of these, there were exhibited typical symptoms of undulant fever.

Bierring[15] in 1929 selected a group of 150 cases occurring in Iowa for particular study of the clinical symptoms. He states that in Iowa undulant fever can be classed as an occupational disease, due to the fact that the majority of the cases in his series could be classified as farmers, members of farmers' families, dairymen, stock buyers and packing house employees. This would indicate that the sources of infection are bovine or porcine in origin. Hardy[16] states that in Iowa undulant fever presents a health problem comparable to that of typhoid.

McAlpine and Mickle[17] in 1928 reported a 0.6 per cent incidence of human infection with brucella abortus in a state, in which 90 per cent of the cattle are infected and only 60 per cent of the milk pasteurized. This series covered ten thousand sera submitted for the Wassermann test. Investigations of this nature are being carried out in many localities and the entire scope of this paper might easily be devoted to the results obtained. These results, however, are bringing to our attention that undulant fever is rapidly becoming a very important health problem.

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*From the Porro Biological Laboratories.

Undulant fever is frequently confused with several rather common diseases; typhoid, tuberculosis, malaria, influenza, acute rheumatism and bacterial endocarditis. In certain sections where tularemia is prevalent it may be mistaken for the "typhoid" form of this disease.

The initial symptoms are quite varied and the onset usually very mild, presenting nothing of a characteristic nature, unless it be that of a mild general infection. Commonly they are fatigue, slight rise in temperature, pains in the joints or muscles and profuse perspiration, especially at night. A severe headache is quite common in some cases. The temperature is usually subnormal in the mornings and elevated during the afternoon and evening. There is an acute form, in which the disease runs a very brief course with early recovery and no remissions.

The chronic type is generally accepted as most frequent and typical. This is usually divided into three groups: (1) ambulatory, (2) intermittent, (3) undulant. The ambulatory type includes those patients scarcely aware they are sick. However, they may run a slight temperature and exhibit a slight weakness. This type is thought by some to be caused by a focal infection of brucella abortus. The undulant and intermittent types are very nearly alike in character except the undulant form is usually more severe. Both of these types are characterized by gradual onset, loss of weight and appetite, general weakness, headaches, high temperature, drenching night sweats, arthritic and neuritic pains. Remissions usually occur every few weeks with normal health being enjoyed between attacks. These two types may persist for a few months or several years.

Undulant fever presents such a varied clinical picture that it is almost impossible to make a diagnosis without the aid of the laboratory. The symptoms presented by the patient are so common to other diseases that the clinician, unless he has had other similar cases, is easily led to make an error in diagnosis and even those physicians who are acutely aware of the existence of undulant fever are frequently misled. Evans quotes Bassett-Smith,[18] an English investigator, as saying: "On account of its variety of forms undulant fever is seldom recognized in its early stages in countries where it is known to exist. Nearly every case is treated for some other disease. If that is the case in countries where the disease is known to be endemic, the chances are almost negligible for it to be recognized by physicians who are not aware that it exists in their own community."

The agglutination test of all laboratory methods is perhaps the most valuable. Agglutinins appear in the blood about the second week. The complement fixation test, when properly performed, is as valuable as the agglutination test and in some instances is more sensitive. However, the reverse is also true.

Blood cultures are especially valuable in differentiating between present and past infection in a patient with a positive agglutination test. The organisms are quite difficult to grow on artificial media for the first few generations, therefore blood cultures are as a rule valueless unless a growth is obtained.

Guinea pig inoculation with patient's blood is extremely sensitive for demonstrating brucella abortus. The intradermal test has promise of becoming quite reliable, especially in those cases in which the clinical symptoms point to undulant fever and all other tests are negative. It is known that the agglutination and complement fixation tests are reliable in about 80 per cent of the known cases.

Next to bovine tuberculosis, contagious abortion is the most prevalent disease affecting cattle. There are no official records relative to the degree of prevalence, for in most states it is not a reportable disease. However, there is enough available information to reveal that contagious abortion is widespread.

The Bureau of Animal Industry states that as a whole bovine tuberculosis has decreased 50 per cent in the last ten years and contagious abortion has increased greatly. In many localities 35 per cent or more of each herd is infected with a resulting annual loss of fifty million dollars. Estimates of other investigators range from eighty to one hundred seventy-five million dollars annual loss.

Carpenter, Baker[19] and others believe that hogs become infected from cattle, that they are less susceptible to infection with brucella abortus and thus only the most virulent strains of the bovine type are capable of infecting them. Very little information is available as to the extent to which hogs are infected. Boak and Carpenter[20] have shown recently that the agglutination test on four thousand fourteen hogs' blood collected in New York State and seven mid-western states was positive in sixty-four hogs.

Infections from goats are apparently of only minor importance in the United States aside from certain localities in the Southwest, where goats' milk is used extensively.

### RESULTS OF SEROLOGIC SURVEY

Since August, 1929, all bloods sent to our laboratory for the Wassermann test, widals, etc., have been subjected to a routine test for brucella abortus agglutinins. The tube method of agglutination has been used on most sera. However, during the last few months the Huddleson slide method has been used to determine the positives. Those sera showing any degree of agglutination were titrated by the tube method.

The antigen used was a seventy-two hour culture of brucella abortus, known as the U. S. Hygienic laboratory strain No. 456 suspended in phenolized saline. The density of this antigen was brought to a turbidity of 1000 (silica standard A. P. H. A. for water analysis). The dilutions used were: 1-20, 1-40, 1-80, 1-160, 1-320, etc.

The sera were inactivated at 56 degrees C. for thirty minutes.

The agglutinations were incubated at 55 degrees C. for two hours, then kept over night at 37 degrees C.

All positive sera were cross-agglutinated with Bact. tularense.

The density of the antigen for cow and hog agglutinations was 35 mm. Gate's scale and the time of incubation were over night at 37 degrees C. and read at 24 and 48 hours later. The dilutions used were: 1-25, 1-50, 1-100, 1-200. This test is in accord with the recommendations of veterinary officials and state live stock authorities of California, Idaho, Nevada, Utah and Washington. This is the official method for the agglutination test certificates in the Pacific Coast and Rocky Mountain states. In this survey the number of agglutinations made were as follows: 6047 human sera, 1192 hog sera, 110 cow sera, and 125 milk wheys.

One complete herd was examined, consisting of fifty-eight cows. Thirty-nine of this herd were infected. The bottled milk as delivered gave an agglutination of 1-50. This dairy is delivering raw milk.

An agglutination test was made on all milk as delivered in this city, and out of forty-one samples, six gave positive agglutinations on the bottled market milk.

In view of the fact that raw meat handlers are reported to have a high rate of infection, it was thought it would be of interest to make agglutination tests on several hogs' bloods to determine roughly the amount of infected meat coming through our slaughter houses. There were three positive hogs out of 1,192 bloods examined. These hogs came from Montana, Idaho, South Dakota and the Middle West.

There were 6047 human sera examined in this series. Thirty-seven of these gave symptoms suggestive of undulant fever at the present time. Sixteen gave histories suggestive of past infection and twenty-nine gave no indications of either past or present symptoms. Twelve of these would for certain reasons give no information whatsoever. As some of the highest agglutinations were in this class, there is every reason to believe that, had they been willing to give information, the list of those giving no histories would have been smaller.

Of the thirty-seven individuals having present symptoms, twenty-six were users of raw milk, three were drinkers of pasteurized milk and eight apparently used no milk. Of the sixteen having histories suggestive of past infection nine were users of raw and three pasteurized milk. The others were unable to recall the kind of milk used at the time of infection.

There have been 294 raw meat handlers' bloods examined, including the employees of a large packing company and only four were found positive. Two of these gave no history and two were drinkers of raw milk. None of the packing house employees were positive. Sixteen of those having positive brucella abortus agglutination gave a cross agglutination with Bact. tularense. However, in each incidence the titer for brucella abortus was many times higher and excluded the possibility of the patient having tularemia.*

In the present symptoms group the agglutinations were as follows:

| 1-20 | 1-40 | 1-80 | 1-160 | 1-320 | 1-640 | 1-1280 | 1-2560 |
|---|---|---|---|---|---|---|---|
| 7 | 4 | 9 | 6 | 5 | 2 | 1 | 3 |

In the past symptoms group the agglutinations were as follows:

| 1-20 | 1-40 | 1-80 | 1-160 | 1-320 | 1-640 | 1-1280 | 1-2560 |
|---|---|---|---|---|---|---|---|
| 0 | 4 | 4 | 4 | 2 | 1 | 0 | 1 |

Those giving no histories were as follows:

| 1-20 | 1-40 | 1-80 | 1-160 | 1-320 | 1-640 | 1-1280 | 1-2560 |
|---|---|---|---|---|---|---|---|
| 7 | 4 | 8 | 5 | 1 | 1 | 3 | 0 |

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*There have been two cases of tularemia reported from the State of Washington[21]. One of these probably came from a neighboring state.

Simpson[22] in his recent book, "Tularemia," reports 32 cases in Dayton, Ohio, contracting the disease during the "rabbit season" of 1927 and 1928. In visits to each of the larger markets in Dayton he found at least one meat handler in each market and all five butchers in one market had had "rabbit fever" at some time. In light of these results a routine agglutination with Bact. tularense (Hygienic Lab. strain No. 38), was made on the blood of every meat handler in this city. There were 294 bloods examined. They were all negative in all dilutions. (This work was made possible through the cooperation of Herman S. Judd, M. D., Director of Health, City of Tacoma.)

The western side of this state is not a rabbit country; consequently, very few wild rabbits are to be found in the markets. Whether these negative results can be obtained on the eastern side of the state with its close proximity to Idaho and Montana remains for investigators in that section to ascertain.

The above results would suggest that sera heated to 56° C prior to the agglutination test and an antigen suspension as heavy as the one employed in this survey, even an agglutination in the lowest dilutions, must be regarded at least as being suspicious of undulant fever.

Occupation did not seem to be a factor in this series. Housewives head the list with fourteen. The remaining thirty-nine were divided into twenty-five different occupations.

In the group giving either present or past symptoms there were twenty males and thirty-three females. This is contrary to what is found by most investigators. However, as this series of positive patients does not adhere to the usual high percentage of occupational infections, the low incidence in the males may be explained on this basis.

### EPIDEMIOLOGY

H. E. Hasseltine, Surgeon, U. S. P. H. S., has most admirably expressed the source of undulant fever in an address before the American Veterinary Medical Association Convention in 1929. It is as follows:

> "It has been stated that there is no direct evidence that undulant fever in man is transmitted by milk. Interpreting the term 'direct evidence' in a strictly legal manner, it is conceded that the statement is correct. Though we have been able to isolate Br. abortus from milk with reasonable consistency, we have not been able to determine the exact time the patient received his infection. Except in experimental cases (and we do not experiment on human beings, if susceptible animals are available), it is impossible to secure direct evidence of the source of a case of infectious disease, when an incubation period is required for its development. To obtain direct evidence, it is necessary to prove that the infection was received from a certain source at a certain time and the time factor is ruled out by the necessary incubation period.
>
> "However, we are able, by the accumulation of circumstantial evidence in a sufficient number of cases, to establish quite conclusively the methods of transmission of most communicable diseases, and as the number of cases investigated becomes greater, the evidence becomes stronger. As these matters follow certain natural laws, we will not find nature consistently giving false indications. By this procedure we have determined the method of transmission of typhoid fever to the satisfaction of both the scientific and lay world.
>
> "Remembering this preliminary statement as to the kind of evidence available, let me call your attention to several circumstances indicating the relation of human undulant fever to the presence of one or more strains of the brucella genus in one or more species of animals that are collectively spoken of as live stock."

The epidemiology of undulant fever will probably not prove to be the same for each locality and the difference will, without doubt, be dependent on the nature of the live stock population. In the central states, with the close association of large numbers of hogs and dairy cows, we might expect more infections with the porcine strain. However, in sections where there are large numbers of dairy cows and relatively few hogs, it may be found that the infections are largely bovine in origin.

The scope of this survey is too limited to draw definite conclusions but with the comparative absence of infections in raw meat handlers and packing house employees and the preponderance of raw milk users, in those giving positive histories, we must at least place raw milk and its products under suspicion.

### SUMMARY

1. Thirty-seven patients of this series showing a positive reaction had present symptoms suggestive of undulant fever. Twenty-six were users of raw milk.

2. Sixteen patients gave past histories suggestive of undulant fever. Nine were users of raw milk.

3. Twenty-nine patients having positive reactions gave no history of Br. abortus infections.

4. There were thirty-three females and twenty males in the positive group.

5. The principal symptoms were weakness, night sweats, arthritic or neuritic pains, loss of weight and appetite and slight chest symptoms.

6. Occupation did not appear to be a factor.

7. All laboratories should run a routine agglutination with Br. abortus on blood sera submitted to their laboratory for a few years at least as a matter of education for all concerned.

8. There were nineteen additional cases reported by other laboratories in this city.

9. There was a total of fifty-six recognized cases in Tacoma and vicinity during the last sixteen months.

10. In this series the ingestion of unpasteurized dairy products must probably be regarded as the source of infection.

11. The increasing number of undulant fever cases each year indicates the importance of this disease as a public health problem.

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# PRODUCTION OF THERAPEUTIC FEVER BY DIATHERMY

Arthur C. Jones, M.D.
PORTLAND, ORE.

The use of fever as a therapeutic measure is still something of a novelty in medicine, although it was known to the Greek school, and has been practiced widely since von Jauregg introduced it to modern practice in 1887. Miller, in the Billings Lecture for 1930, gives an excellent review of nonspecific vaccine and protein therapy. Typhoid vaccine given intravenously to cause a chill and fever reaction has given excellent results in paresis, and also in other afebrile conditions. Polyvalent vaccines in a multitude of combinations have been utilized for the treatment of numerous ailments, particularly the chronic gonorrheal conditions and arthritis.

Protein therapy has been employed in nearly all acute and chronic diseases of supposed bacterial origin, and is now considered especially effective in acute polyarthritis, chronic infectious arthritis, iritis, both acute and chronic, thromboangiitis obliterans, paresis and multiple sclerosis. Malarial treatment of paresis has become a commonplace since von Jauregg began it in 1917, and it offers hope of a good percentage of remissions in an otherwise almost hopeless disease. It is the logical outcome of countless observations of improvement in lues of the central nervous system following intercurrent disease.

Many theories have been advanced to explain the mechanism by which these nonspecific agents produce changes in disease, but we do not yet fully understand how the body responds to fever. Fever is a common accompaniment of treatment by all these agencies. Since most of the self-limiting diseases are accompanied by temperature reactions, it may be assumed that fever stands in some causative relation to the cure. In contrast, diseases which are not self-limiting are usually not accompanied by fever. MacCallum[2] pointed out that fever is probably a beneficial reaction that should not be interferred with, and that production of immune bodies probably proceeds at higher temperatures in a way which is impossible at lower. He expressed the conviction that the febrile process is advantageous to the organism, and doubtless associated with the development of protective substances to combat the injurious agencies that have invaded the body.

Consideration of the foregoing facts has led a few workers to investigate means of producing an increase in body temperature without the introduction of infection or foreign proteins. Bazett and Haldane,[3] Landis and coworkers,[4] and a number of others have experimented with temperatures produced by immersion in hot water. Others have succeeded in causing artificial fever with hot, dry air and with radiant heat from many sources. The use of baths of mineral waters, mud and peat in arthritis has been known since the days of Hippocrates, and is general in Europe today as an empiric but effective remedy.

A departure from the usual forms of fever therapy was marked by King and Cocke[5] in October, 1928, when they began the treatment of paresis with fever produced by diathermy. They chose paresis for this pioneer investigation because pyretotherapy had been used more widely in this disease than in any other, and because of the favorable reports of results with such treatment. They attempted to duplicate the typical temperature curve of double tertian malaria, with a maximum about six degrees above normal. Treatments were given daily for eight to twelve days. Over twenty cases of paresis

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* Read before the Forty-first Annual Meeting of Washington State Medical Association, Mount Baker Park, Wash., Sept. 2-3, 1930.

had received this treatment previous to publication of their paper in November, 1929. Twelve of this number had a satisfactory number of reactions, and a check was made from two to ten months following treatment showed that eight of these were definitely improved. Eleven of the twelve had gained in weight, and two had full clinical remissions. The colloidal gold curves showed a flattening in the first portion. One patient died of a complicating acute nephritis which developed after eight treatments had been given.

These workers feel that the beneficial results of fever produced by diathermy are easily comparable with those obtained with malaria, and that there is every evidence that the benefits derived in the past from fever therapy by malaria and other substances have been due entirely to the accompanying elevation of temperature, and not to any associated biochemic reaction to the infecting organism.

Similar research is being conducted by Neyman and Osborne[6] at Northwestern University and Cook County Hospital in Chicago. They have produced temperatures of any desired degree, within physiological limits, by means of high frequency currents applied through large, bare metal electrodes. Remissions have been obtained in paretics similar to those which follow inoculation with malaria, and they have been doing work which is not yet published on certain types of arthritis, particularly the hypertrophic form. They warn against too great and too sudden density of current and also against improper contact between the body and the electrodes; both dangers may be obviated by proper technic.

Diathermy was used as a means of producing hyperpyrexia in a study of blood chemistry changes made by Bischoff, Ullmann, Hill and Long[7] at Santa Barbara Cottage Hospital. Their results show conclusively that there is no difference in effect between raising the body temperature by a high frequency electric current, so that heat is generated within the body, and in raising it by external application of heat. Loss of carbon dioxide is of fundamental importance in hyperthermia. The pH of the blood becomes more alkaline. There is a shift of bases to the blood proteins, and the hemoglobin of venous blood is more oxygenated. They observed that with the rise in blood pH the inorganic phosphorus falls below normal limits in some cases, and that the urine phosphorus is decreased during the period when the blood phosphorus falls.

Preliminary work by Mortimer at Northwestern University seems to show that the effects of the fever produced by diathermy on the blood of man and dogs are quite characteristic of fever in general, with no permanent changes. Variations in the time necessary for the same current intensity to bring about similar increases of temperature are possibly due to variations in the response of the temperature-regulating mechanism in different animals. He finds that no definite outward ill effects result on repeated daily exposure of the same animal to high temperatures. The various organs or tissues of the body heat uniformly, for all practical purposes, when subjected to large volumes of high frequency current, and are easier to heat than nonliving tissues.

The technic of raising body temperatures with diathermy currents is chiefly concerned, first, with supplying safely a sufficient quantity of current to the patient; and, second, with reduction of heat losses to a minimum. Thus, a rise of temperature is inevitable, if these requirements are met. The source of current used at the University of Oregon Medical School is a machine of the vario-frequency type, built to give currents of sufficient volume for all ordinary diathermy treatments. King and Cocke[5] used this type of machine for some of their work, but found that one especially built to carry heavy loads over long periods was better for the prolonged operation which is necessary when the entire body must be heated. More time is required for the general-purpose diathermy apparatus to bring the temperature up to the desired maximum, but its use is entirely feasible and practical.

The electrode surfaces in contact with the body must be large, and must be applied evenly to avoid concentration of current with consequent tissue injury. Two foil electrodes, each seven by nine inches are strapped on over the ventral surface of the body, and exactly similar ones on the back. In cases of paresis a jacket similar to a restraining jacket may be advisable, with the electrodes mounted on the inner side. Thus the patient can move about without danger of loosening contact with the plates and so causing concentration of current and a burn. There is no danger of any injury to the skin, if care is used in applying these electrodes. Some workers are using oval electrodes with deep serrations about the edges which seem to function equally well. A backing of sponge rubber helps to make apposition even.

### THERAPEUTIC FEVER

Insulation against heat loss is essential to success, and the procedure outlined by King and Cocke has been found to be most satisfactory. A rubber sheet is spread over the bed, then a double wool blanket, which prevents puddling of perspiration on the rubber. An exactly similar arrangement is placed over the patient, and other wool blankets are thrown over the outer rubber sheet and tucked in well to the patient's chin. No part is exposed at any time, since slight heat loss prolongs the time and decreases the efficacy of the treatment.

The temperature should be raised gradually, so the current is increased slowly, reaching a maximum of 3000 to 4000 milliamperes in thirty minutes. The body temperature continues to rise after the full current strength is attained, and usually comes to a maximum at about the second hour, if other factors are not varied. The rise is more rapid after a temperature of 100° or 101° F. has been reached, and there is a good deal of discomfort at about this level. Most of the clinicians who have done this work prefer to give a sedative when restlessness begins, usually hyoscine and morphine by hypodermic. It has the effect of decreasing the sweating also, thus aiding in the temperature rise.

The current may be discontinued after the temperature of the patient has been maintained at the desired level for thirty minutes or more, and the fall to normal is regulated by removal of the insulating blankets. A rise of one-half to three-fifths of a degree has often been noted after cutting off the current, and if all the coverings are left in place, the temperature may remain near the maximum for three or four hours, after which it drops rather rapidly to normal. A quick reduction may be secured by removal of coverings at any time and may be hastened safely by tepid or cool sponges if necessary.

Thorough examination before treatment and frequent temperatures throughout the treatment and posttreatment period are essential safeguards. Patients with marked cardiac weakness should be excluded, and those with mild heart lesions must be watched very carefully while under treatment. Nephritics are poor risks, and marked arteriosclerosis, hypertension of any degree, pulmonary tuberculosis and thyrotoxicosis are contraindications to the treatment. Other contraindications will present themselves to any clinician. An attendant must watch the patient at all times, and the treatment should be discontinued on any sign of collapse, too high a rise in pulse rate or extreme restlessness. The procedure is one for hospital practice. With proper safeguards and careful choice of patients this is a practical and safe method of raising the body temperature.

Preliminary work in raising temperatures to fever level with diathermy has been done through the dispensary service at the University of Oregon Medical School. Maximum temperatures of 103° to 106° F. have been obtained with proper insulation against heat loss, the milliamperage ranging from 1400 to 1800. One case of paresis received ten treatments, and immediately following these was given a malarial inoculation. At the time of her death from a cardiac condition five months after completion of the combined treatment, she was in a period of clinical remission. Sufficient time has not elapsed to evaluate correctly other cases of neurosyphilis. The duration of the acute stage of rheumatic iritis seems to have been lessened to about half the usual time by applications of artificial temperatures daily for four days in two cases. Other applications of this method are in a purely experimental stage, though the treatment of hypertrophic osteoarthritis seems very promising of good results to date.

Soiland[8] raised the body temperatures of patients with arthritis by means of radio waves of high frequency. He noted that those with acute or chronic types improved markedly, while results were few or nil with the atrophic types, although the latter had less joint pain following treatment.

A new apparatus was described by Nagelschmidt[9] in 1928, the advantages of which are that it does not require direct contact of the electrode to the part treated, and that it can heat any part treated, and that it can heat any part or the entire body without the danger of producing a burn. He suggests that an "aseptic fever" produced by such a means does not increase the combustion of body substances; injurious phenomena of ordinary fever can be eliminated, and the protective qualities retained.

Encephalitis lethargica and multiple sclerosis are offering some hope of improvement with pyretotherapy. Pouppirt of San Francisco[10] has used baths at 110° F. to increase temperatures in cases of Parkinson's disease, and concludes that these patients stand temperatures of 104° to 105° very well. The presenting signs of tremor, pains in the muscles, ocular crises and stiffness are helped in nearly every case, and in a few cases are entirely done away with. Depression is lessened, and the general health of these patients is improved. He uses the treatment as a particularly useful adjunct to reeducation of patients with severe sequelae of encephalitis, and states that it occasionally enables them to return to useful employment when all other measures have entirely failed.

## SUMMARY

High frequency currents may be used to create any desired temperature rise within the body without danger of injury. The procedures outlined may be safely carried out in any hospital department properly equipped for the work, provided the precautions suggested are observed.

The advantages of this form of therapy over other types of pyretotherapy are: (1) Complete control of the temperature throughout the treatment, which may be given at any time and as frequently as the clinician chooses. (2) The normal metabolic activity of the body is stimulated by an outside source of heat. (3) A method of study of fever effects is offered with temperature as the only variable factor. (4) No foreign protein or vaccine is introduced, therefore there is no disturbance of the immune reactions nor depletion of the complement of the blood. (5) The risk is much less with malarial infections, in which there are from 5 to 10 per cent deaths reported. (6) All patients selected may be treated. Many persons are naturally immune to malaria, and with it there is added difficulty in keeping the strain of organisms alive or of obtaining a new strain, if the original strain should be lost. This is especially an advantage where only a few patients are to be treated at a time. The means are always available. (7) Clinical and laboratory research may be conducted on the effects of fever in many other conditions.

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# THE LABORATORY IN THE SERVICE OF THE PUBLIC HEALTH*

H. J. SEARS, PH.D.
PORTLAND, ORE.

Every hospital and private diagnostic laboratory, when conducted honestly according to scientific principles, performs an important service for the public health. In this paper, however, it is intended to confine the discussion to the role of the duly constituted public health laboratory. The place of such laboratories in the modern organization of public health is now so well established and generally accepted that their services are dispensed with only in the most backward communities. In some of the more populous centers, on the other hand, municipal and state laboratories have developed to such proportions in their personnel, equipment and scope of work undertaken as to become internationally famous centers of research and teaching. Between these two extremes we have in the United States every possible gradation. To attempt to determine the proper function of a laboratory by examining the practices in other parts of the country, therefore, inevitably leads to bewilderment and indecision.

Like many other American institutions, the public health laboratory in most localities has been the product of evolution. From a small cubby hole or corner, where a part time health officer can make a few stains and examine a few diphtheria cultures, it grows to a bona fide laboratory, small and poorly equipped to be sure, but with a part or full time worker, often indifferently trained, in charge. Even such a beginning soon demonstrates its value and in communities of a size to justify it the laboratory's growth usually keeps pace with other health work, often indeed outstripping it.

Once the great service a laboratory can render is fully appreciated and a well trained director is in charge, with a definite sum budgeted for operation, the activities entered into will depend more than anything else upon the training, industry, ambition and personality of the director. The live wire laboratory man naturally desires his division to take a prominent place in the health work of the community. He is, therefore, to the limit of his time and ability continually reaching out into new fields, testing this, examining that, always diagnosing, whether it be diseases, epidemics or sanitary conditions. His job is finding the facts. In doing this he never needs to overstep his own function. Upon making a diagnosis he only makes a report to the proper department of the health organization. In this way he seldom clashes with other officials, although he may frequently open up new jobs for them or indicate methods of attack upon old ones.

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* From the Department of Bacteriology and Hygiene, University of Oregon Medical School.

* Read before the Conference of City and County Health Officers at Portland, Ore., Sept. 17, 1930.

The health laboratory is primarily a service department. This does not mean, of course, that its service is at the beck and call of every other health official or that the director is not autonomous in his own department. It means only that his work af-ects the accomplishment of the general aims and objects of the health department not directly but indirectly through other divisions of health work. It is conceded, of course, that in most, if not all, of our laboratories in the Northwest, the director will have many functions other than laboratory work. To the extent that his service extends into other fields he will be many officials in one. This does not affect the thesis just stated, that the work of the laboratory as such is almost solely for aiding and making more effective the work of other divisions. Perhaps the only field which the laboratory enters, where its freedom from the active interests of other departments is complete, where its reports are of immediate interest only to its staff, is that of pure research, a field into which the workers are often privileged to look, and do look with longing, but which only too few are permitted to enter.

It would seem then, if the foregoing thesis is correct, that one way to arrive at a true comprehension of the role of the laboratory in modern public health work is to examine closely into the question of the services it is able to render to the various other divisions of this organization. It is clear, of course, to every health officer of experience that service very rarely can be considered without regard to cost. Recognized laboratory tests may be prohibited either by their low service factor or their high cost. It is comforting to note, however, that the most serviceable laboratory tests are seldom the costliest. I think I do not need, either, to argue before this group the point that the laboratory should always be supported entirely by the community. Any system involving the collection of fees from individuals or corporations would introduce so many difficulties into administration as to seriously hamper the whole health program.

The division of health work, in which the function of the laboratory is the most obvious and in which it renders most conspicuous service, is that which has to do with the control of communicable disease. It must be remembered that in this work the end and aim is prevention, and services performed for or upon sick individuals are carried out chiefly for the purpose of preventing the spread of the disease to well persons. In the acute infections the work of the laboratory lies in performing those tests which will aid in the early removal of cases of the recognized communicable infections from contact with others, assisting in locating possible healthy carriers of these infections and in examining specimens from convalescents and carriers for the purpose of intelligently terminating quarantine.

Only the relatively specific, decisive tests should be performed. It is not the duty or responsibility of the public health laboratory to carry out those diagnostic procedures that are more for the purpose of prognosis and treatment than for diagnosis. In suspected cases of typhoid fever blood cultures, widals and stool cultures should be performed. These lead to definite and early diagnosis, hence contribute to preventive measures by making it possible to isolate the patient and instruct his attendants regarding disposal of infected material. On the other hand, blood counts, hemoglobin determinations and other blood chemical tests lead only indirectly and uncertainly to diagnosis. The results of such tests are of interest chiefly to the patient and his physician. They are of but slight interest to the health department. Even the specific tests, such as blood cultures, type determinations and the like, once the diagnosis has been made, are not the responsibility of the health laboratory. Their purpose is prognosis and treatment. They should be carried out in private laboratories. So long as isolation and quarantine regulations are properly complied with, the care of the case itself is of no importance so far as the division of communicable diseases is concerned.

In the case of certain of the chronic, nonquarantinable diseases the occasion for laboratory work is somewhat different. Here the therapeutic conduct of the case is of great interest in the matter of prevention. Since as long as the case exists it is a potential source of infection of others, the health department is interested not only in an accurate initial diagnosis, but it is likewise desirous of seeing that the case is speedily and properly treated and of keeping constantly informed of its progress, especially in regard to those factors which determine infectiousness. It may be entirely within the sphere of the public laboratory to examine blood smears frequently during the course of a case of malaria or sputum specimens of the tuberculous person under treatment, but it would be invading the domain of the private laboratory, if it made a practice of examining blood cultures during the course of an attack of pneumonia or of making spinal fluid examinations to determine the treatment of a case of meningitis.

Perhaps the profoundest misunderstanding of the role of the laboratory in aiding communicable disease control has been in connection with the venereal diseases, especially syphilis. To properly appreciate this role a full comprehension of the character and scope of the program for venereal disease control must be had. The mere examination of specimens sent in from persons who present themselves with self-diagnosed venereal sores, followed by a desultory attempt to restrict the activity of cases found positive, was long ago found to be an ineffective method. The plan now prosecuted includes an active case finding campaign with rigorous control of infected individuals, including insistence upon and control of treatment by accepted methods. The Wassermann reaction, more recently the Kahn, is the very crux of this method. Any restriction upon the free use of these tests by practicing physicians would, in my opinion, to the extent of that restriction, tend to render ineffective the whole program. I can think of no case in which the results of a Wassermann or Kahn might be of value to an attending physician and not of some interest to the health official in charge of venereal disease control. And not only is this official interested in the initial result but he is concerned also with subsequent tests that throw light on the effectiveness of treatment.

From these points of view, therefore, I would advocate that the Wassermann or Kahn test for syphilis be carried out free upon any and every specimen submitted by duly licensed physicians, provided the results of that test are made fully available for use in venereal disease control. It is obvious, of course, that such a practice will be subject to some abuse, but by judicial care on the part of the health office this can be kept down to a negligible minimum. The value of the information gained by this procedure in the work of the venereal disease division will fully justify the expense involved. Most experienced public health men concur in this attitude toward the use of these tests and the practices in nearly all parts of the country are in agreement with it.

Next to the routine work in the service of the communicable disease division, the most important role of the laboratory is in connection with epidemiologic investigation. The function of the laboratory is so important in this field that it may be said to be the very foundation of the science of epidemiology. Its effectiveness is evident in the general experience that epidemics of those diseases, of which the specific causes are recognizable readily in the laboratory, are the quickest to be noted; their sources are easiest found and they are soonest brought under control. More and more the laboratory is invading the field of epidemiology and the hope of every epidemiologist is that more diseases will be added to the list of those diagnosable by specific laboratory tests.

The methods of application of laboratory science to the study and control of epidemics are too well known to need any discussion in this paper. It may be stated, however, that the emergency character of the work may make it desirable that the public health laboratory carry out many tests that in ordinary instances would not be the business of this laboratory. If, for example, a milk borne epidemic of septic sore throat is suspected, the investigation may call for, in fact the proof of the existence of such an epidemic may necessitate culturing dozens or hundreds of cases of sore throat, mild as well as severe. It will nearly always involve the bacteriologic examination of the milk of individual cows and will presume a minuteness of study of the organisms isolated that approaches that of the research bacteriologist.

In the routine diagnosis of the sporadic case of dysentery it may be of little significance whether the causal organism is of the Flexner, the Hiss-Russell, the Strong or the Schmitz type. But in attempting to find the source of an outbreak of dysentery the knowledge of the type becomes indispensable. To extend the work of the laboratory to include this additional fact often calls for skill, experience and judgment wholly beyond that required for the routine control work. It cannot be emphasised too strongly that the service the laboratory can render in the investigation of epidemics is very great indeed, but its highest service involves research methods. Too much must not be expected, therefore, of the laboratory neither manned nor equipped for research.

As in the communicable disease work, so in the sanitary division the laboratory is the very bulwark of its efficiency. To appreciate the service it renders here one only need imagine the milk inspector without his total counts or the sanitary engineer without his B. coli determinations. The food inspector and the sanitary inspector only wish that the laboratory could render them equal service.

In his sanitary work the director of the laboratory must be guided by the same general principles as in communicable disease control. His criterion should be public service not private or corporational convenience. In my own short time spent in a public health laboratory I have been asked to do everything from examining the stomach contents of a presumably poisoned dog to removing stains from hotel napkins. On the other hand, it is not advisable for the laboratory to be too critical of the motives of persons submitting specimens. In the larger centers of population most specimens should come through, or at least with the sanction of, the workers in the sanitary division but in the smaller communities it may be rendering a real service to public health to accept many specimens from private individuals. The abuse of such a privilege usually can be detected readily. If a farmer wants the water of his well or the milk of his cow examined, it may be a worth while contribution to public health both from the sanitary and the educational point of view to make the examinations required. It is taken for granted, of course, that the samples shall be taken and submitted in such manner that the result of the examination conveys trustworthy information. To report that B. coli is present in a sample of water contained in an unsterile vessel or that the typhoid bacillus is not found in a sample of milk that has soured in transit to the laboratory would be grossly misleading. These are exaggerated instances, of course, but many others not so obvious come to the attention of every laboratory director.

Another function of health laboratories, about which there has been some controversy, is that of the manufacture and distribution of certain biologicals for the prevention and cure of disease. This is not properly a question that belongs to this paper to discuss. The role of the laboratory here is to follow the policy of the department in general in regard to the furnishing of vaccines and serums free or at cost. If this is the policy, as is becoming quite general, then it merely remains to decide whether it is cheaper or more convenient to prepare these things at home or buy them from licensed plants. The question of competing with local private laboratories does not enter this situation. All such manufacturers must be licensed by the U. S. Public Health Service. I believe there is a tendency, more and more, for even the large public health laboratories to stay out of the manufacturing business. The politicians have not yet taken an interest in this opportunity for municipally owned public utilities.

Whatever the plan be for their manufacture, the laboratory should exercise some control over the character and effectiveness of the biologicals used in the community, at least to the extent of investigating allegedly poor materials. Even small laboratories may sometimes render a real service to the cause of public health by a few intelligent tests. The inoculation of a few guinea pigs last year revealed the fact that a certain Schick test material supplied locally was of four times the potency it should have been. An underneutralized toxin-antitoxin mixture was picked up in the same way. The furnishing of manufacturers with local strains of organisms to be added to those used in immunizing animals for the production of curative serums may be a simple but very valuable way to serve the interests of a community.

I believe I have thus far indicated the chief fields of usefulness of the public health laboratory and it is seen that the divisions of the health organization which are served are primarily those having to do with epidemiology and communicable disease control and with the care and sanitary supervision of various commodities such as water, milk and food. Perhaps in the future, as health work develops, other departments will come to look to the laboratory for aid. It seems reasonable to suppose that laboratories sometime will be generally equipped to aid in the field of industrial hygiene and the control of occupational diseases. It is as important to diagnose and show the sources of cases of lead or benzol poisoning as to do the same with cases of typhoid. The occupational infections already receive attention from the laboratory. Anthrax, glanders, tularemia and, more recently, undulant fever must be considered among the occupational hazards.

Though the laboratory would seem to render most of its service directly to the above mentioned divisions, it must not be overlooked that other departments also profit greatly from its findings. I need only mention the fields of child, maternal and school hygiene. The relationship to vital statistics may be less obvious but certainly not less real. The accuracy and completeness of vital statistics are profoundly affected by the work of the laboratory. Fewer errors occur in reporting the causes of illness and death where the diagnosis is confirmed by specific tests, and in those diseases for the diagnosis of which the physician relies largely upon the laboratory, notification is certainly more complete. Few cases of diphtheria escape reporting. I wish we might say the same of measles and whooping-cough.

I have suggested above that research may be a proper function of a public health laboratory, but that only the chosen few are privileged to fulfill this function. If we may call by the name of research, however, all those forward looking inquiries into the applicability to local health problems of the newer knowledge of bacteriology, immunology and chemistry, then research should be the aim and practice of even the smaller laboratories. Such laboratories often are in a peculiarly advantageous position to render important service by their researches. The enthusiastic examination for abortus and tularense agglutinins of large numbers of serums submitted for the widal test is a case in point. This procedure is now, or should be, a routine in all laboratories. Another test which deserves similar investigation is the making of blood plate cultures from scarlet fever convalescents to aid in determining the proper time to release from quarantine. I am pleased to note that at least one of our Oregon health officials is now regularly releasing epidemic meningitis cases only on nasopharyngeal cultures. The field of parasitology is woefully neglected in our public health laboratories, although parasitic diseases are becoming serious problems in many quarters. Pathogenic fungi receive almost no attention, although in some places, especially as occupational infections, they cause widespread disability and discomfort. These are but a few of the fields in which the progressive laboratory man may apply his zeal for research to the benefit of his community and the world at large. Moreover, it is these ventures beyond the frontier of established routine that add zest to the game. The laboratory man whose work becomes humdrum and monotonous is not working at the highest efficiency.

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NONMALIGNANT NODULES OF BREAST THE RESULT OF PROLAPSE. Lilian K. P. Farrar, New York (*Journal A.M.A.*, Nov. 1, 1930), finds that prolapse of the virginal atrophic breast is occurring with alarming frequency in this country owing to the present fashion in dress. There is danger of permanent prolapse of such a breast, and perhaps danger of cancer developing from prolonged stasis of breast tissue. Plastic operation for prolapsed atrophic breasts is an unnecessary mutilation of a young girl. Plastic operations on prolapsed atrophic breasts will deprive nursing mothers of breast tissue and milk ducts with too little tissue left for nursing and possibly "caked" breasts and abscesses of the breasts as a result. The change of dress with proper uplifting support of the breast will cure the condition if treatment is begun early.

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# MEDICAL ECONOMICS *

HORACE J. WHITACRE, M.D.
TACOMA, WASH.

In the June, 1930, issue of NORTHWEST MEDICINE I published an article on "Economic Aspects of Illness." This brings together some working facts and figures that have a bearing upon the present-day cost of illness, and discusses briefly the question of whether the middle class family with an income under five thousand dollars a year can afford to have first class medical attention.

It shows: (1) That the prevalence and the cost of illness give staggering figures when estimated for the nation or for a community, and that the cost of disease is one of the biggest problems that society has to meet; (2) that the phenomenal development of the science of medicine has unavoidably increased the cost of illness, and that cost will probably increase rather than diminish; (3) that 98 per cent of the wage earners of the United States have an income under five thousand dollars a year, and that with existing standards of living the average wage earner has not a very large buying power for medical service. Hospital costs were analyzed, and it has been gratifying to me to find that students of this problem who have set up cost price hospitals at the Massachusetts General Hospital and at the University of Chicago, for the express purpose of meeting the problem of the middle class patient, quote prices that are well above those that prevail in the state of Washington.

My study of professional charges as a factor in the high cost of sickness indicated to me that doctors and nurses are underpaid rather than overpaid for their services; that their incomes are low when compared with other occupations; that there has not been an oppressive increase in office and house visit or operative fees during the past twenty-five years; and that professional charges cannot be singled out as the cause of the high cost of medical care.

It would seem to me that this previous article, together with such others as you may have read, give sufficient figures and present sufficient facts to convince all of us that a problem does exist; that we, as doctors, are on the firing line; and that we have got to meet the economic issues as an organized economic unit. Doctors are individualists by training and practice, and it is probable that they cannot be otherwise, either in the daily performance of their professional work or in the adjustment of their charges to meet the ever-changing financial status of their patients, but this problem requires organization and cooperation.

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* Read before the Forty-first Annual Meeting of Washington State Medical Association, Mount Baker Park, Wash., Sept. 2-3, 1930.

I believe that the most useful thing the Washington State Medical Association can do right now, for society and for the welfare of its members, is to organize in a new way for a study of the economic status of society and our relationship to its problems. We are abundantly organized for the study and practice of the science of medicine, but we are not sufficiently organized, or crystallized, in our financial relations with the public.

Right now we need to develop a group consciousness regarding our financial as well as our professional obligation to all of the people, all of the time. We need a group with understanding of the various factors that underlie the present complaint that illness is costing too much. We must study the problem of treating the indigent. We must readjust our thinking, and develop a group conclusion as to how we are going to meet the new requirements of industrial surgery. We must work out some plan whereby all of the people, no matter what their income, can get excellent medical care, without crippling cost and without jeopardizing the exalted standards of medical science.

As has been stated in my previous paper, there is probably no single explanation, and no single remedy, for the mounting costs of illness. Nor is it our problem alone to solve or to explain; yet the treatment of disease and injury are the exclusive field of activity of the medical profession, and we have a heavier obligation to help in the solution of any problem that grows out of illness than does any other social group.

First of all, let us develop the group realization that 98 per cent of the wage earners of the United States and of our own community have an income under five thousand dollars a year; that 93 per cent have an income under three thousand; and that 79 per cent have an income under two thousand per year. Next let us understand that this 98 per cent of our wage earning public are the backbone of our country, that they keep commerce moving, and that they expect to pay for what they get. This is the group that is now finding it hard to meet the costs of moderate or severe illness, because society has boosted the standard of living to a point where the family budget is already stretched to the breaking point. It is this group that is seeking lodge and contract care.

All will grant that two thousand dollars per year, or $168 per month, for a family of two or four, does not give a very big margin above the actual necessities of life. A five thousand dollar income gives a better margin. But house, food and clothes are no longer the actual necessities of life. Last year the American public spent twice as much for movies as for the operation of all the hospitals in the United States, and there was one automobile for every five inhabitants, including men, women and children. High pressure salesmanship on the installment plan has still further mortgaged the weekly pay check for a radio, an electric washer, a new coat and other luxuries. Illness comes; there is no money left to pay for hospital or professional services. Where is the fault? Shall we condemn the employer because he does not pay higher wages, and give a large margin for the present standard of living? Shall we condemn installment buying? Shall we say that the average wage earner has no right to these comforts and pleasures? Assuredly it is not our function to attack the subject on any one of these points, but it is our duty to give our support to a movement that seeks to develop a saner economic standard of living.

It is certainly our duty to educate the public to a proper understanding of the economic value of health, the certainty of illness as a definite part of their financial problem, and to help them understand that a definite amount of their income should be set aside for illness, before luxuries are purchased. The physician who is acquainted with his patient's circumstances can do a great deal to hold down hospital costs, if he will take a definite stand, and insist that high priced rooms, special nurses and special services should not be used when they are not required for the safety of the patient. The cost to patients for glasses and surgical appliances could be reduced by fifty per cent, if our profession would take a firm stand on the question of a fifty per cent commission to the doctor who sends the prescription.

Then there is another question of ethics which is largely responsible for the criticism which is directed against our profession in this economic controversy. Medical ethics call upon us to be fair and honorable in our dealings with patients, and I do not believe that the surgeon who operates upon a servant girl who earns fifty dollars per month, and charges her three hundred dollars for the operation, is either fair or honorable. The large fees charged to low wage earners by a certain small group of commercial physicians in the profession are an unjust burden upon the low wage earner, and they are a reproach upon our profession. In self-defense and in fairness to the low wage patient the profession should eradicate this unethical practice.

These are but a few of the ways in which an organized group consciousness could contribute to the problem of helping the low wage earner to keep down his cost of medical care by saving waste. Much more could be said regarding drugs, patent medicines, quackery, high cost of surgical equipment, specialism and professional overhead, but I want to pass on to a discussion of the problem of the indigent, industrial surgery and the cost clinic.

I had intended to confine my discussion of economics to the economic problem of the middle classes, yet this subject is so closely related to the problem of charity in the state of Washington, where we have no great charity hospitals, that I feel we should begin to develop a group consciousness on this subject. Furthermore, it is probable that a certain proportion of the fourteen per cent of wage earners who have an income of less than one thousand dollars per year cannot afford to pay for medical care when serious illnesses occur.

It has been estimated that one-eighth of the sick are destitute, and that the physicians of the United States contribute $456,000,000 annually to charity work, as estimated upon a minimum charge basis of $2 per call. A survey in St. Paul estimates the charity work of each physician at $3000 per year, and a recent survey in Tacoma indicates $1800 for each physician reporting. Secretary Wilbur, chairman of the National Cost of Medical Care Committee, has called attention in more than one published article to the fact that the medical profession is the only economic unit in society that has for a definite part of its program the donation of a large and undetermined percentage of its services. Nobody else does it. Unquestionably, the care of the indigent is the responsibility of all of the remainder of humanity, and our part in the matter should be only our fractional part as a section of the population. But we have always had it all. The members of the attending staff of the metropolitan charity hospital and of the teaching hospital are perhaps sufficiently remunerated for their services by the added professional prestige that results, and by enlarged experience, but this is not true of charity work as it is found outside of the largest cities. The profession considers it a priceless privilege to be able to serve the poor in illness, and will always choose to do its full share of gratuitous service in this field, yet it is uneconomic and unjust to expect the medical profession to bear the entire load all of the time. I feel that by degrees a united profession should bring about a public sentiment that will establish a taxation fund, from which doctors, nurses and hospitals can be paid a cost price for their services. We already have county and city hospitals which take care of a part of this work, and it would be but a step to extend the service to all of those who truly need it. It will be necessary, however, for the profession to set up a proper cost price unit for the treatment of such patients before such a proposal can be made.

The most perplexing problem in economics that confronts the profession today is that of industrial surgery. The director of the Public Safety Division of the National Safety Council states that during 1927 there were in the United States 95,500 accidental deaths. Six per cent of all deaths that occur are from violence. There were 23,000 accidental deaths from industrial accident, and 3,250,000 nonfatal injuries in industry; 115,000 employees in industry incurred partial permanent disability, and 1150 suffered total permanent disability. These injuries cost industry one billion dollars. More than 27,000 deaths occurred as a result of automobile accidents, and there were 750,000 motor injuries last year. Almost an equal number of deaths resulted from home accidents, while miscellaneous accidents, including railroad, street car and drowning, caused 24,000 fatalities.

These figures alone are sufficient to show us that industrial surgery makes up a huge volume of professional work. We all know its scientific importance, but have not been very diligent in studying its economic requirements.

The very first thing we must understand in our study of industrial medicine is the attitude of industry toward medical service. We must remember, first, that industry has accepted the medical department as a part of the operation of that industry, operating a department whose costs and results must be taken into consideration as a cost in the production of the product that industry makes and passes on to the consumer, the same as any other cost. Industry knows that proper care is good business, and is willing to spend money for the organization of an adequate medical department.

This means that industry has the right to expect the medical department to work understandingly with every other department of a given industry, along lines of costs, efficiency and results.

A second conclusion of industry is that just any doctor will not do in the treatment of their sick and injured. More and more the employer and the employee are insisting upon a doctor who is experienced, and the employer wants a doctor who has sensed the problems of compensation, malingering and mental inferiority in their relationship to injury.

Good medicine in industry is precisely the same as good medicine elsewhere, insofar as the management of the sick and injured is concerned; but there is an added element of economic responsibility and accountability, which has had slack attention, and which does not exist between doctor and private patient.

Just now we are becoming alarmed when we realize that the average doctor has neglected the subject, and that our failure to meet the economic requirements of industry and of the employee has resulted in all sorts of industrial, lodge and hospital associations for the care of accident and sickness. Industry and the public have taken the matter out of our hands, and we are serving them according to their plan and for a remuneration set by them. Unquestionably a large industry like the Endicott-Johnson Shoe Manufacturing Corporation is acting upon sound and just economic principles, when it sets up a complete medical department within its walls, and provides every equipment for the prevention and care of accident and disease, as well as for rehabilitation.

In the state of Washington industrial accident is taken care of by the Workmen's Compensation Act, and a distressing economic unrest has been created within the ranks of the working class and the profession because of the unsatisfactory operation of the act. The act provides that the workman may choose his own physician, or that the employees of a given plant may contract with a given doctor to render medical care. For one reason and another the contract plan has prevailed with employers and employees. At the present time the employees are dissatisfied, but do not know the way out. Within the profession an apparently unjust and sometimes unethical monopoly has been developed by a few doctors, and the remaining 90 or 95 per cent of the profession find themselves deprived of the privilege of doing any of the industrial surgery in an industrial state. This situation has developed under the industrial act very largely because, on the one hand, the few have had an industrial sense and the business acumen to meet the need of industry and of the working man for medical care at a low cost; and, on the other hand, the remainder of the profession has not organized along economic lines to meet conditions.

Contract practice is not unethical, and may be a real necessity in isolated localities; yet it has developed serious injustices, and there is a grave question as to whether it is economically sound. It is the easiest and cheapest way out for the employer, and he is satisfied.

If that majority of the profession which does not do contract surgery wishes to reclaim this work, it is quite apparent that it must present to the public an economic plan which will take the place of the contract method. I do not know just what this plan should be, but it must be a united plan, and it must be economically sound. It must be a plan that will insure a high grade of efficiency in first aid, professional care and rehabilitation of the employee. It must be a plan that includes a positive economic accountability to industry.

A noncontract plan implies a free choice of physician by the employee. We are very familiar with the statement that there is an inalienable right on the part of the patient to select his own medical adviser, his own physician, his own surgeon. In Lyman Wilbur's last communication to the Cost of Medical Care Course he lays down three fundamentals, the first of which is, "The personal relationship between physician and patient must be preserved in any effective system of medical service."

These are good principles and must be retained, but an unqualified application of this principle of a free choice of doctor by every individual employee, regardless of his enlightenment, is not sound economics in industrial surgery. Neither is the choice of a friend or family doctor by an employer as company surgeon economically sound.

Industrial surgery requires surgical education, surgical ability, surgical experience and proven results. All doctors cannot meet these requirements. There has been a lot of "ballyhoo" written about industrial surgery as a specialty, and the statement made that nobody excepting these so-called specialists should do industrial surgery. The general profession is not going to accept any such classification, but if they are to resist it successfully our component societies must establish a classification of its doctors, they must insist that their members work within the range of their training, and they must insist upon prompt consultation with surgical experts, when in doubt. With these limitations and with this frank acceptance of the economic responsibilities to industry by organized medicine, a choice of physician from the general profession is sound.

This leads me to a concluding suggestion as to how a group consciousness and a sense of constructive responsibility within the profession can meet the economic requirements of the low wage earner and of industrial surgery. Dr. M. L. Harris of Chicago advocates the organization of medical centers, owned and managed by at least a majority of all of the members of each county medical society, where those who are unable to pay regular fees to the physician and industrial cases can be given the best possible diagnosis and treatment, and for a charge that will pay the actual cost of their care, including the services of the physician. Ambulatory charity work would be done at this center and paid for at cost by a taxation fund. An institution of this sort would guarantee the standard of work that the entire profession wishes to sponsor, it would operate upon strictly business and economic lines, and would meet the obligation of the profession to give a high quality of medical service to all of the people all of the time. In such an organization the qualifications of each man could be checked and the public as well as industry would be given the assurance that the entire profession stood behind their directed choice of a doctor for their specific disease or injury.

I am not sure that this is precisely the form that our unit economic organization should take, but it should be something like this. Such an organization would have to be very carefully worked out along strictly business lines, would require the fullest cooperation within the profession, and most of all a group consciousness of the social problem involved. I have no final plan to offer for adoption, but do feel that something must be done. It has been the object of this paper to present the problem, attempt to crystallize our thinking, and help, if possible, in the development of a group consciousness.

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SCHONLEIN-HENOCH'S PURPURA WITH INTRA-OCULAR HEMORRHAGE AND IRITIS. William L. Benedict, Rochester, Minn. (*Journal A.M.A.*, Nov. 22, 1930), reports a case in which acute iritis, with intraocular hemorrhage and staining of the cornea with blood, was seen in Schonlein-Henoch's syndrome. His experience has verified statements regarding the course of severe cases of Schonlein-Henoch's purpura, the irregularity of onset and of symptoms, and the apparent ineffectiveness of treatment.

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# POSTOPERATIVE SURGICAL CARE*

JOE W. BAKER, M.D.
SEATTLE, WASH.

A review of this subject is offered to recapitulate the fundamental principles of postoperative surgical management as understood and practiced by us, rather than to offer any novel ideas. Every surgeon develops a "routine" more or less peculiar to himself, and since many methods of management are successful, the review of any one routine may offer a few new suggestions.

## PREPARATION

It has been said that, if the patient is properly prepared for operation and proper surgery is performed, no postoperative care will be necessary. In order to increase the resistance to operative shock we believe it advisable during the forty-eight hours preceding operation to give the patient considerable easily assimilable carbohydrate food. This insures a plentiful storage of glycogen within the body, and prevents rapid depletion of glycogen stores following operation, during the period when the food intake is limited. Otherwise acidosis may result, due to faulty metabolism of fats in the absence of sufficient glucose. Carbohydrate feedings are administered up to 10 o'clock the night before the operation, at which time the so-called "night-cap" is given, consisting of two teaspoonfuls of honey, one glass of milk, two teaspoonfuls of lactose, six crackers, and one pat of butter. A very effective means of increasing the fluid as well as the glycogen reserve is to keep a pitcher of sweetened cool fruit juice at the bedside the day before the operation and to encourage the patient to drink a glassful at least every hour.

Some postoperative complications, such as certain instances of vomiting, distention and even paralytic ileus, have been attributed in part to previous psychic shock to a sensitive nervous system. We, therefore, feel justified in preventive preoperative efforts to allay such shock. Sodium amytal and other sure and rapidly acting barbiturates used as preanesthetics are proving to be an aid in this regard. For the same reason 5 or 10 grains of veronal in a glass of warm milk are given the evening before operation to aid sleep. We used to order a cleansing enema early in the morning of operation and the nurse promptly awoke the patient at six or six-thirty for the first ordeal of what promised to be the most nerve-wracking day in his existence. We now prefer to accomplish as much cleansing as possible the day before and to let the patient sleep as late as he will the day of his operation.

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* From the Mason Clinic.

* Read before the Thirty-eighth Annual Meeting of Idaho State Medical Association, Couer d'Alene, Ida., June 27-28, 1930.

Ambulatory patients studied in the Clinic and recommended for surgery are, where possible, admitted to the hospital several days before operation, not only to build up their glycogen and fluid reserves, but also to allow them to become accustomed to the hospital and its management. Such patients are allowed to be up, are encouraged to walk about the halls and to become familiar with their nurses, the signal system, etc., or, in other words, they are made to feel at home before the operation. Many of these people have had their nerves and physical strength strained by examinations and tests, and the cold vision of an operation ahead. In such cases a few days of comfortable rest in the hospital changes their entire appearance as well as their perspective.

We feel that it is particularly important, at least in patients past forty-five years of age, to study the function of those organs of the body which will be placed under strain by a surgical procedure. If we know before hand where to anticipate trouble, we are more apt properly to interpret early complications. If we operate on a patient, knowing that the kidney function is only about 50 per cent of the normal, we will not be apt to overlook uremia developing after operation, but without this warning knowledge we might be prone to take the first signs of trouble lightly and account them of no consequence.

Therefore, in all patients of middle age and beyond, we like, where possible before the elective operation, to study the condition of the heart, the circulation, the kidneys, the lungs and the liver. It is needless to say that this cannot be done in the same detail before emergency surgery. In studying the kidney function, one or two urine examinations may not give us sufficient information. In elderly patients the concentration of the blood urea or nonprotein nitrogen may show unsuspected kidney impairment. The phthalein function, or Mosenthal tests, may also prove an aid in certain cases.

In these patients it is of importance to know the blood pressure and the condition of the peripheral and coronary blood vessels. One index to the coronary circulation in patients past forty-five years of age is a positive or negative history of attacks of angina pectoris. In toxic goiter the history of attacks of angina pectoris is usually not a contraindication to operation. In performing emergency operations the risk has to be taken, but for most other operations we consider a reliable history of a true anginal attack as a danger sign to be respected. Careful study with the electrocardiograph may offer aid in determining the condition of the heart muscle in borderline cases. Roentgenograms of the chest and fluoroscopic study may also be of assistance in determining the cardiac reserve of a patient in need of surgical care. The digitalization of certain of these defective hearts before operation may be life saving. While delay of emergency operation is not justified in order to permit extensive study of the vital functions, in less urgent operations we can take time to study these matters which are so influential in the eventual outcome.

The same is true of diabetic patients. If a diabetic patient has acute appendicitis he should be operated upon as soon as the diagnosis is made. Subsequently diabetic complications and emergencies must be looked for and treated as they arise. In these cases in particular it is essential for the surgeon to have the assistance of the internist in caring for the patient. Liquid carbohydrate to the extent of 50 to 100 grams daily can be given by mouth or by injection of 5 or 10 per cent glucose, if the intake by mouth is limited, along with the necessary insulin as determined by the blood sugar level and the overflow of sugar into the urine. At the same time the carbon dioxide combining power of the blood and the acetone bodies in the urine are the best advance guides to the approach of acidosis and warn us when more carbohydrate or insulin is necessary.

However, when performing elective operations upon diabetics, the status of the diabetic condition should be thoroughly understood and the condition treated until the metabolism is in the best possible state before operation is undertaken. We like to have the blood sugar as low as 150 mg. per 100 c.c. before the operation. In cases of chronic pus infection, such as chronic osteomyelitis or purulent sinusitis, this may not be possible, but even in these patients we prefer that the blood sugar should not exceed 200 mg. per 100 c.c. Of course diabetic patients should never receive ether or chloroform anesthetics. Nor do we give sodium amytal in these cases for fear of masking the approach of acidosis or coma. Ethylene or spinal anesthesia is to be preferred in these cases.

Patients should be prepared for prostatectomy with a great deal of care. Where there is a large residuum of urine in the bladder this must be withdrawn very slowly, for all of us have probably seen the abrupt suppression of urine and death following the too rapid relief of the back pressure, under which the kidneys have become accustomed to function. While there are many contrivances for the slow decompression of the distended bladder, a very practical method is to leave a small ureteral (not urethral) catheter in the bladder and thereby restrict the outflow to a small drip over a longer period of time. Patience and care are necessary during the period that an effort is being made to restore the blood nitrogen, the hemoglobin and the kidney phthalein index to normal, and considerable judgment is required in deciding how long to persist in this effort. It may in some instances be better not to operate than to do so with an assured high mortality.

Other conditions requiring special care, such as toxic goiter and carcinoma of the large bowel and rectum, with and without chronic obstruction, can not be discussed but deserve mention.

Finally, the patient undergoes operation and is returned to his room for several weeks of care. Before going into the details of our postoperative routine I would like to mention the four objectives which this routine is designed to accomplish, i.e.: (1) Adequate oxygen, (2) adequate water, (3) maximum rest and sleep, (4) proper elimination.

We help to supply *adequate oxygen* by stimulating the function of the heart and kidneys. In elderly people, whether a heart lesion is present or not, we like partially to digitalize the heart before operation and then to give a daily maintenance dose after operation. This increases the circulation through the kidneys. Increased fluid intake will serve as a further stimulus to the kidney and insures its maximum function in eliminating the toxins which must follow an operation or an anesthetic. If the patient is anemic or has sustained a hemorrhage at operation, a transfusion may be of advantage in restoring the hemoglobin to a level sufficient to carry adequate oxygen. Judd points out that the oxygen tent is of help in promoting sufficient oxygen is such cases as debility, asthma and bronchiectasis.

The importance of avoiding cerebral anemia during the operation has been pointed out by various authors. The possibility of this has been brought to our attention, particularly since the use of spinal anesthesia. Before Pitkin inaugurated ephedrine as a preliminary to spinal anesthesia, large and sudden falls of blood pressure were sustained, and the early deaths are believed by Labat and others to have been due to cerebral anemia, resulting from the fall in blood pressure rather than from novocaine paralysis of the medulla. Surely less pronounced degrees of cerebral anemia also occur frequently at operation and if unrecognized are responsible for much of the shock and atonia seen subsequent to operation. Thus the delicate brain centers are partially starved of oxygen during the operation and may, therefore, retard all the vital processes subsequent to operation. This cerebral anemia, if recognized early by the feeble pulse, the fall in blood pressure and the pallor of the patient, may be remedied by tilting the body to the Trendelenburg position. This promotes the venous return to the heart and favors the cerebral circulation. Enrichment of the blood should be attempted by the use of inhalations of 95 per cent oxygen and 5 per cent carbon dioxide, the latter to stimulate the respiratory center.

The second essential, *adequate water,* is supplied by forcing fluid for forty-eight hours before operation. A goodly amount of this reserve will be lost through perspiration on the operating table, if the room is kept too warm. We used to keep the operating room at 80° F., but Dr. Emmet Rixford on his last visit recommended a temperature of 70° as less conducive to loss of fluid and strength.

After operation, for the first twenty-four hours, when the intake of fluid by mouth is limited, we give routinely a proctoclysis of tap water. In our hands glucose water and salt water have proven irritating frequently, with the result that more is expelled than is absorbed. There seems to be some question as to whether anything but plain water can be absorbed by the rectal mucosa, so that we feel it is as good as any. The nurse will frequently allow the water to drip so fast that it serves more as an enema and is expelled rather than retained. We, therefore, specify in our routine orders that it shall not drip over sixteen to twenty drops per minute.

Sometimes more fluid must be administered than can be taken by mouth or absorbed by rectum. It then becomes a question as to whether it is best to give the additional fluid by vein or by the subcutaneous route. In the average case we think more good is derived from a subcutaneous infusion than from an intravenous injection. Given subcutaneously, the fluids establish a reservoir for absorption over several hours' time, while fluid given intravenously is not held in the body so long and may place unnecessary strain on the circulation. However, where diuresis is desired we have given normal saline or 5 per cent glucose intravenously. Then, too, where there is shock, fluid given intravenously will build up the blood volume and stimulate the heart; but on the other hand, where the heart is failing, the extra blood volume may cause a dilatation of the degenerated heart. The incidence of infection is greater following subcutaneous administration than intravenous therapy, for, as Mann has pointed out, it is almost impossible to infect the blood stream by direct injection into the circulation. In giving fluid into the vein we use solutions of double distilled water not over twenty-four hours old and require that it take at least forty-five minutes to the quart in running in.

To secure *maximum rest and maximum sleep* we allow frequent hypodermics of morphine the first forty-eight hours after operation. Thereafter we reduce the number gradually and give one of the barbiturates at bedtime for sleep. The importance of giving medications, enemas, liquid nourishment, etc., as much as possible at one time, so as not to be continually disturbing the patient, is a little point about which many nurses have to be reminded. At the same time that the patient is aroused for these purposes the nurse is instructed to turn him and encourage him to inhale deeply several times, thus helping to avoid passive congestion and hypostatic pneumonia, and at the same time promoting the elimination of gas from the intestine.

After spinal anesthesia the foot of the bed is elevated for six hours to promote the venous return to the heart and to increase the circulation through the brain in the face of an unstable blood pressure. This is held by many to be a wise practice after any operation in order to reduce the incidence of venous stasis and phlebitis. After six hours, however, we promptly elevate the head about 30° to avoid pulmonary congestion. Often after abdominal operations the patient will derive comfort from having his knees flexed so as to relieve the stretch on the abdominal muscles and diaphragm.

The last of the four fundamentals mentioned in the routine is *elimination*. Kidney elimination has already been discussed. As for the bowel, we have found it more satisfactory not to disturb it with enemas until the third day subsequent to the day of the operation. This rule is never broken except by special order, when gaseous distention is marked and cannot be relieved by the liberal use of a rectal tube, frequent turning, and warm stupes to the abdomen. And even in these cases we often prefer to wash the stomach first.

Our stand upon this would seem to be justified by a recent article by Alvarez, in which he describes a gradient rhythmicity and irritability of the gastrointestinal tract which decreases in strength from above downward. Hence normally the bowel moves its load from the stomach or point of greatest strength downward to the rectum or point of least strength, just as a ball rolls down a hill; but irritation or inflammation at any point along the bowel tends to raise the irritability at that point and thereby to flatten out this gradient so that the intestinal contents tend to back up above the site of irritation and to speed up below this site. Thus Alvarez explains the vomiting and diarrhea often seen hand in hand in acute appendicitis. By the same reasoning, enemas given too early or too frequently tend to irritate the rectum and thereby to reverse peristalsis.

After the third day an enema is given daily. Simultaneously the patient is given some form of mineral oil by mouth every day in order to facilitate natural bowel movements as soon as possible.

Only a few of the more common complications will be mentioned, and briefly. Nausea and vomiting during the first twenty-four hours may be from the morphine, the anesthetic, reflex from handling of the viscera or from blood pressure changes. The general nursing care, with ice-cap to forehead, cracked ice in the mouth and, if vomiting, sips of warm water to wash the stomach better are sufficient. Later on, where an unusual thirst, fast pulse, pinched expression and epigastric distention point to a dilatation of the stomach, we impress upon the nurses the importance of calling us early so that we may pass a tube and lavage the stomach thoroughly. In this case, if a large amount of gastric contents confirms the impression of dilated stomach, we cocainize the nose, pass a Levin tube through the nostril, and leave the tube indwelling for twenty-four to forty-eight hours. Through this tube the stomach is lavaged continuously by means of the Robertson Ward apparatus until the stomach regains its tone (fig. 1).

Tympanites and gaseous distention, the second and third days postoperative, have given us much trouble. We used to withhold morphine and give calomel, then later pituitrin, and above all frequent enemas. We now feel that all of these only aggravate the condition and that they are contraindicated. Mild measures, such as the use of a rectal tube, with frequent turning of the patient, turpentine stupes, and morphine have given us the best

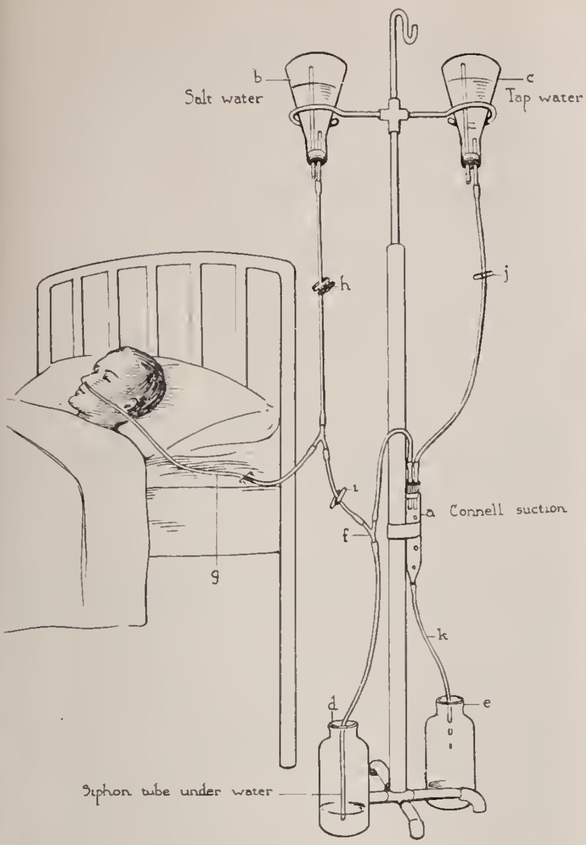

Fig. 1. The Robertson Ward combination of Connell suction with duodenal tube for continuous lavage of the stomach and duodenum. The apparatus is simple to assemble, is easily handled by the nurse, and affords comfort to patients with dilated stomach, paralytic ileus, peritonitis, etc. It carries off gas as well as liquid.

The principle is simple. Constant dripping from container c, regulated to about 50 drops per minute by petcock j, causes a mild negative pressure in tube a, due to the air bubbles carried down the rubber tube k, between the drops of water. This negative pressure is transmitted to the duodenal tube by the Y-tube connection at f. Here it serves to start the siphon g, f, d, and to maintain it when the column of liquid from the stomach to the collecting can d, is broken by gas bubbles.

The patient is allowed all the clear liquids he desires, since they are withdrawn at once by the tube and merely serve to keep the stomach clean. When the patient is asleep, salt water from the can b, is allowed to run in through the tube by releasing petcock h and closing i. Afterward the clamps are reversed and the solution withdrawn by the suction. Since continuous lavage with soda would deplete the stomach acids, it is essential to use salt rather than soda in can b.

results. Only in very exceptional cases is an enema given earlier than the third day.

Should this distention persist and the patient develop a definite ileus, the stomach is washed out and continuous lavage instituted as described above. We feel that the early institution of continuous lavage in these cases is the nearest approach to a specific remedy for ileus that we have and that the apparatus devised by Robertson Ward of San Francisco is the simplest means of accomplishing this satisfactorily.

This is true of the paralytic or adynamic ileus resulting from nerve shock, trauma to tissues at operation or to a number of unexplained causes, as much as it is of the ileus resulting from peritonitis or organic intestinal obstruction. In all three of these conditions the symptoms and blood chemistry findings are identical. The blood chlorides fall, the blood nitrogen and $CO_2$ combining power become elevated and the patient is thrown into a toxic alkalosis. Ellis blames this toxicity upon a poison which he has demonstrated in the cells of the mucosa lining the small intestine and which is particularly concentrated in the cells of the duodenum in these cases. He has isolated this toxin from the lumen of the duodenum in patients with peritonitis and intestinal obstruction, and he believes that it is this poison excreted into the lumen of the intestine and absorbed through the lymphatics that is responsible for the toxic death of such cases. Hence, the specific advantage of continuously lavaging the stomach and duodenum, if this be true, thereby removing this excretion before it is absorbed into the system. It should be recalled, however, that the patient is already in alkalosis with low blood chlorides so that this continuous lavage should be with *salt* water and not with *soda.*

Of next importance in these patients is the administration of adequate chlorides and fluid. We like to give a minimum of three quarts of normal saline by injection every twenty-four hours. If the blood chlorides are as low as 400 mg. per 100 c.c. we like to give one or two quarts of 3 per cent (typertonic) saline intravenously in addition to one or two quarts of normal saline subcutaneously. It has been proven by Haden and Orr that in these cases, if the blood chlorides can be restored to normal, the blood nitrogen and $CO_2$ combining power will also be reduced. More concentrated solution of salt may be given, if less fluid is desired.

Other points in the handling of such cases include splinting the bowel and reducing its secretions by the use of morphine and by avoiding any attempts to promote peristalsis. Hot stupes to the abdomen are appreciated by the patient.

In closing I might say that our policy has been to err on the side of undertreatment rather than overtreatment, to disturb Nature as little as possible, and to help her along by mild rather than by drastic measures. Probably the one thing that has given the most dramatic relief to the greatest number of truly ill postoperative patients is stomach lavage. This recalls Dr. William Mayo's saying that he would rather see his surgical resident carry a stomach tube than a stethescope.

# CONGENITAL OBSTRUCTION OF THE POSTERIOR URETHRA IN CHILDREN*

Charles D. Donahue, M.D.
EUGENE, ORE.

Submucous fibrosis of the vesical neck in children has been diagnosed frequently at postmortem but rarely has this condition been recognized in the living. Campbell[1] states that he has been able to find only twelve cases of this lesion in children reported in the literature during the past fifteen years. To these he adds seven cases of his own. The false rarity of the disease as compared with the actual incidence prompts us to report the following case.

November 5, 1929, Dr. E. C. Joseph of Corvallis referred to us a boy, age eight, complaining of general weakness, listlessness and an apparent tumor of the lower abdomen. There was a urinary frequency of every half hour unaccompanied by pain. The child was unable to force a stream and was troubled with a great deal of dribbling. There was an occasional nocturnal enuresis. The mother also told of the urine being of a milky appearance at times. The rapid loss of weight and the listlessness of the child prompted her to seek medical advice.

At three weeks of age the child had a very severe attack of erysipelas. The mother stated that it had covered a very large area of the body. He had been subject to many and repeated skin infections. There was a history of scarlatina, chicken-pox, and whooping-cough. The abdomen had always been large. The mother had noticed that during infancy the child's diaper was merely damp and never became saturated at intervals, as in the case of the other children.

As he grew older the mother noticed that he could not force a stream and that this disturbance grew gradually worse. The child was usually content to sit and watch the other children play but never entered into the sports.

Physical examination revealed a small undernourished lad who appeared very tired and listless. Fully clothed he weighed about thirty pounds. His face was drawn, very sallow, and the general appearance was one of an impending uremia. The posture was stooped and not unlike a small and weazened old man. The temperature was subnormal. The abdomen exhibited a soft fluctuating tumor that extended to the umbilicus. The teeth were good and the throat looked normal. Through auscultation and percussion no real pathology could be detected in the chest and heart. The blood urea at this time was 68.4.

There was little doubt but what the fluctuating mass was a hugely distended bladder. Catheterization confirmed this and the bladder was emptied by fractional decompression. The boy was returned to his physician for treatment which consisted of indwelling urethral catheters and repeated catheterizations.

He was returned to us on December 4, when a study of urethra and bladder was made. At this time there was a general improvement in the physical make up. The child seemed much brighter and felt much better.

Under general anesthesia a number sixteen cystoscope was readily passed into the bladder. There was a slight hang to the instrument as it passed through the vesical neck. The fundus of the bladder was pitted with large and small trabeculae. There was a marked elevation of the trigone. At the vesical neck in the region of the prostate there was a firm transverse bar formation, with the bladder dropping pouch-like posteriorly. Drawing the beak of the instrument outward, the prostatic urethra and colliculus appeared normal. There was no evidence of valve formation. The membranous and anterior urethra were normal.

A number twenty sound was passed which fitted rather snugly. This in turn was followed by a number twenty-two urethroscope. The bar formation was fulgurated at the same setting.

On returning home he was seen occasionally by his local physician and returned to us on June 25, 1930. At this time there was three-fourths of an ounce residual urine that contained some blood and many pus cells. The albumin was four plus.

On June 27 a cystoscopy was performed under local anesthesia. A number eighteen scope was passed readily into the bladder. A ureterogram was practically successful but no attempt was made to outline the kidney pelvis. Due to the greatly dilated ureters, the catheters would fold many times on themselves. The bladder was very much improved. In place of the bar formation there was a shallow midline sulcus which was still reddened. The fundus was marked by the disappearance of the small trabeculae. The blood urea at this time had dropped to 30.5.

Instructions were given to return at intervals for ureteral and kidney pelvis lavage. We last saw him on July 10. At that time he could readily pass a good full stream. His appetite was good. He was very active and seemed to be enjoying life.

His life was ended rather abruptly when he contracted chicken-pox and shortly after this developed myocarditis and died. He expired September 6, 1930.

I am informed by his physician that the bedside urine looked clear and before this the kidneys had been functioning as well as usual.

It is apparent in the foregoing history that before that there had been much kidney destruction, evidenced by the extreme back pressure and continual pus and albumin in the urine. An effort was made to clear up the chronic pyelitis and ureteritis, and allow regeneration of active kidney tissue. It will be noted that early diagnosis and treatment are imperative for a favorable prognosis.

With few exceptions it is necessary to give an anesthetic to make a satisfactory examination of the urethra and vesical neck in children. Treatment of the posterior urethra may sometimes be very annoying to the patient and the physician. Many complications are possible and the procedure of treatment should be fully explained to the parents.

We are reminded of one young man who submitted to a fulguration of a very large colliculus. The posturethra became infected which was followed by a bilateral epididymitis of the recurrent type. A bilateral epididyotomy was finally resorted to, to effect a cure.

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* Read before the Fifty-sixth Annual Meeting of Oregon State Medical Society, Portland, Ore., Sept. 17-19, 1930.

[1] Campbell, M. F.: Submucous Fibrosis of the Bladder Outlet in Infancy and Childhood, J.A.M.A. 94:18. May 3, 1930.

Nevertheless it seems to me that any child reaching the age of five who has an abnormal micturition should be a subject for thorough urologic study.

In classifying these obstructions we wish to call your attention to three: (1) Submucous fibrosis of the vesical neck, (2) valve-like obstructions, (3) congenital hypertrophy of the verumontanum.

The cause of vesical neck fibrosis is unknown. It is definitely established that the condition is congenital and is unknown in the female. Undoubtedly intercurrent infection hastens the degree of fibrosis.

*Pathology.* Campbell states, "the lesion is characterized by a great increase in connective tissue in the submucosa of the vesical outlet. This fibrosis may not only involve a portion of the sphincteric ring but often extends far into the trigonal musculature as well as the adjacent bladder wall. The fibrosis may involve the entire circumference of the vesical outlet or only a portion of it. In the latter instance the lower segment, that corresponding roughly with five to seven of the face of a clock, is most often the site." Sclerosis forms here a median bar obstruction. In most cases the trigone shows muscular hypertrophy.

The upper urinary tract falls heir to the same pathology seen in any chronic vesical neck obstruction. Diverticula, huge, tortuous ureters and infected hydronephroses are common. Infection of kidney, ureter and bladder is sure to follow. Kidney function is decreased and a uremic condition will eventually make itself evident.

*Symptoms.* The symptoms of any congenital obstruction in childhood are those of vesical neck obstruction. In infancy the objective symptoms are obscure until after diaper has been discarded.

Enumerating them we would list the symptoms as follows: (1) Failure to saturate the diaper at intervals, (2) frequent and painful urination, (3) hesitation and the lack of a full, strong stream, (4) dribbling, (5) pain in the lower abdomen, (6) loin pain, (7) tumor formation in the lower abdomen, (8) purulent urine, (9) loss of weight and emaciation, (10) symptoms referable to an impending uremia.

The diagnosis should be easy. Rule out the possibility of a beginning tabes or cord lesion. The type of obstruction probably will have to be determined by the urologist. However, with a clear urethra, extending to the vesical neck, the catheter in the hands of a careful manipulator may even determine to an extent the type of obstruction. If the catheter rides smoothly into the bladder, think of a valve obstruction or a hypertrophy of the verumontanum. If the catheter meets or passes through a firm fibrous obstruction, one has to think of a diaphragm valve obstruction or a fibrosis.

After the bladder has been emptied by fractional or gradual decompression, the child may be given an anesthetic and the posturethra and vesical neck may be studied through the infant cysto- or urethroscope. It must be remembered, however, that these children require adequate preoperative preparation before this procedure can be carried out. A definite hang to the instrument with the presence of a hard fibrous transverse bar, without the bifurcated colliculus which marks the beginning of the valves that extend anterolaterally, verify the diagnosis of a submucous fibrosis. Further application of the therapeutic test, removal of the obstruction, will give relief and verify the diagnosis. The diaphragm valve which may be situated anywhere in the urethra may admit nothing more than a filiform guide.

*Treatment* may be instituted after preoperative preparation has been carried to the extent that the patient is a good preoperative risk. Preoperative treatment may consist of cystotomy or the indwelling catheter.

It is more firmly fixed in my mind now, that a very careful study of the heart should be made. Possibly, if exercise had been limited in our one case, the disaster could have been averted.

The suprapubic operation is preferred by some men, but we have never excised a fibrosis in a child. It is quite necessary that the excision be complete in order to eliminate the danger of a permanent suprapubic fistula. In postoperative care prevent contractures of the scar by the use of sounds or catheters.

If the operation is to be carried out through the urethra, its gradual dilation may first be necessary. Our experience with the fulgurating wire was very satisfactory. Young's baby cautery punch is successfully used by those who are thoroughly familiar with the instrument. The valve-type obstruction may either be excised or fulgurated.

Hypertrophy of the verumontanum can be fulgurated through the urethra. Any intraurethra method may require more than one sitting. The reactions of the intraurethral methods, as a rule, are very slight.

It is necessary to keep in touch with these patients for months afterwards and follow-up treatment should be carried on in an effort to eliminate the chronic infection of the upper urinary tract. Forced intake of fluids is imperative.

### SUMMARY

1. Early diagnosis may prevent permanent kidney pathology.

2. Submucous fibrosis is a congenital disease that is possibly more common than the literature indicates.

3. Submucous fibrosis of the vesical neck in children is a disease of the male sex.

4. The type of treatment is indicated by the existing pathology.

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# INFECTIOUS MONONUCLEOSIS[*]

Ronald C. Romig, M.D.
EUGENE, ORE.

Infectious mononucleosis, as described in the recent literature, is a symptom-complex characterized by an enlargement of the cervical glands, and by a less constant enlargement of the spleen and other glands. With this there is usually a leukocytosis with an absolute increase in the lymphocytic elements of the blood. This increase in the lymphocytes occurs whether or not a leucocytosis is present.

This symptom-complex has been described in recent literature under various names, as acute sublymphoemische lymphomatosis, acute benign lympoblastosis, glandular fever and acute lymphadenosis. In 1889, E. Pfeiffer described a condition known as glandular fever, which he called "drusenfieber" and which was characterized by a short febrile course, accompanied by enlargement and tenderness of the cervical lymph glands, occurring chiefly in children and mostly in epidemic form. Prior to this Filatow, Rauchfuss and Korsakoff were claimed to have noted and incompletely studied this condition.

Since the work of Pfeiffer epidemics of the disease have been recorded in various parts of the world. The chief characteristics have been essentially the same in these epidemics and mention is often specifically made that there was no accompanying tonsilitis. Mention is also made of abdominal symptoms and enlargement of the spleen. In none of these earlier reports was mention made of studies of the blood. Later reports of epidemic glandular fever have included studies of the hematology of the disease.

Tidy and Morley[1] in reviewing the literature find no instance prior to 1921 of a full blood count of a previous case diagnosed as glandular fever. In 1923, Tidy and Daniel[2] give an account of an epidemic of glandular fever occurring in a boys' school. The first case in this series was a master, aged 23 years. Eleven days later two boys reported sick. During the next four days four more cases occurred. After an interval of about two weeks fourteen more developed. They recorded blood counts in nineteen cases which showed definite evidence of lymphocytosis. They also stated in nearly all cases that it was difficult to classify many of the cells as small or large lymphocytes.

Carlson et al[3] report an epidemic occurring in Wisconsin of over 838 cases. Blood counts of fourteen cases were studied and showed a lymphocytosis. Sixty per cent of the cases were between the ages of three and eight, and over 98 per cent in patients under twenty-five years of age.

From time to time the presence of a lymphocytosis during an acute infection has been noted by various authors. Turch,[4] in 1907, recorded three such cases that have frequently been alluded to in the literature. One case with angina and glandular enlargement resembled acute leukemia with recovery. In the same year Cabot[5] recorded four cases showing a lymphocytosis, one following an infected finger, one following a series of boils, another occuring during a streptococcic sore throat with swelling of cervical glands and later involvement of the axillary and inguinal glands, a fourth of swollen glands in the neck following a cold. All these cases showed leucocytosis with a lymphocytosis from 62 to 86 per cent. These last two cases closely resemble infectious mononucleosis.

Other similar cases have been reported in the literature, but it was not until the work of Sprunt and Evans[6] in 1920 that these cases became recognized as a clinical entity. At this time they reported six cases having symptoms and signs so much alike that "they may be considered provisionally as a clinical entity." Since then a fairly extensive literature has accumulated with reports of sporadic cases occurring chiefly in young adults and epidemics of glandular fever in children, with studies of the hematology of these cases.

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[*] From the Health Service, University of Oregon, Eugene, Ore.

[*] Read before a Meeting of Lane County Medical Society, Eugene, Ore., November 22, 1929.

During the past three years we have observed and studied six cases which we will report.

Case 1. F. K., a male student, age twenty, was admitted to the University Infirmary March 9, 1927, complaining of pain and swelling in the neck and slight headache. The illness began about four days previous to admittance, when the patient first noticed a swelling of the right side of the neck. Several days later a cough developed and he felt as if he were "taking cold." Prior to this he felt well, and the day before he noted the first swelling he took part in track trials.

*Past history.* Measles, whooping cough, mumps, chicken pox. Tonsils removed at age of eight years. No history of frequent colds.

*Physical examination* revealed the right cervical glands swollen and tender. They were discrete and felt brawny. The left cervical glands were only slightly involved. The mouth and throat were essentially negative. Tonsils out. Epitrochlear, axillary and inguinal glands were palpable. Chest negative. Abdomen negative. The spleen was not palpable.

*Course.* On admission the temperature was 99.6°. The highest temperature, on the second day, was 102° in the evening. From this point it gradually came back to normal, with a slight rise in the afternoon for four days. Patient was discharged on the seventh day much improved but with swelling on the right side of the neck still present.

*Laboratory report.* Wassermann negative.

*Hematology.*

| Date | Hbg. | R.b.c. | W.b.c. | Lymphocytes | Monocytes | Glandular leucocytes |
|---|---|---|---|---|---|---|
| 3/ 9/27 | 100 | 5.4 | 11,600 | 74 | 0 | 26 |
| 3/11/27 | | | 12,000 | 72 | 2 | 28 |
| 3/12/27 | | | 14,000 | 78 | 1 | 21 |
| 3/18/27 | | | 9,200 | | | |
| 4/ 6/27 | 90 | 4.8 | 7,200 | 45 | 1 | 54 |

On April 6 cervical, axillary and inguinal glands still were somewhat enlarged, although at this time the blood count was normal. Patient was in good health and was going about his regular duties.

Case 2. D.L., a female student age twenty, reported to the dispensary February 28, 1928, complaining of a slightly painful swelling below the angle of the jaw on the right side and a similar but smaller swelling on the left side. No other glands palpable. Mouth and throat negative. Temperature 99°. She was allowed to go home. She visited another physician who said she had sinus trouble. The following day she developed a temperature of 100° and was admitted to the Infirmary.

*Past history.* Measles, whooping cough, chickenpox and tonsillitis. Tonsils were removed in 1924. Patient had mumps one month previously.

*Family history* essentially negative.

*Physical examination.* Nose slightly hyperemic. No tenderness over the sinuses. Mouth and throat negative. Tonsil out. Chest negative. Abdomen negative. Spleen not palpable. Posterior cervical glands swollen and tender. More marked on right than left.

*Course.* On the second morning a red macular rash appeared on the calves of the legs. Itching was quite marked. In the evening patient complained of a sore throat. The temperature dropped to normal on the second day but on the third day it was 100° in the afternoon. The next day she felt much better and went home against our advice. Two days later the temperature was normal. Swelling of glands still present. The sore throat was treated for several more days before recovery was complete.

*Hematology.*

| Date | Hbg. | R.b.c. | W.b.c. | Lymphocytes | Monocytes | Glandular leucocytes |
|---|---|---|---|---|---|---|
| 2/28/28 | | | 4,250 | 52 | | 48 |
| 3/ 1/28 | | | 4,500 | 41 | 1 | 58 |
| 3/ 3/28 | 76 | 3.6 | 4,100 | 56 | | 41 |
| 3/12/28 | 83 | 4.0 | 7,100 | 44 | | 56 |

Case 3. A. S. T., male student, age nineteen, was admitted to the University Infirmary May 7, 1928, complaining of swelling of the neck, sore throat and malaise. About seven days before the patient first noticed a swelling on the left side of the neck. This disappeared and the right side of the neck became swollen. He then began to notice weakness, sore throat, and generalized aching over the body.

*Past history.* Measles, mumps, chickenpox, scarlet fever, tonsillitis. The tonsils were removed.

*Family history* essentially negative.

*Physical examination* revealed cervical glands swollen, tender, firm and discrete. The inguinal glands were only questionably enlarged. No other glands palpable. Nose hyperemic. Pharynx only moderately hyperemic. Tonsils out. Chest and abdomen negative.

*Course.* For seven days the patient ran an afternoon temperature which reached 100° every day but one. The temperature then dropped to normal where it remained. During this time his chief complaint was stiffness, pain in neck and sore throat.

*Hematology.*

| Date | R.b.c. | W.b.c. | Lymphocytes | Monocytes | Glandular leucocytes |
|---|---|---|---|---|---|
| 5/ 7/28 | 4.8 | 5,500 | 51 | 7 | 42 |
| 5/10/28 | | 7,400 | 70 | | 30 |
| 5/11/28 | | 6,100 | 63 | | 37 |
| 5/29/28 | | 9,200 | 68 | | 32 |

On May 29, although the patient was in good health, the blood count had not returned to normal. He left school shortly afterward and no further blood counts could be made to determine when the blood count returned to normal.

Case 4. J. B., male student, age twenty-one, was admitted to the Infirmary December 12, 1928, complaining of sore throat, malaise, and swelling of the neck. The swelling he thought had been present only about two days. The sore throat began about the middle of November and he had been under treatment at the University Dispensary but no improvement in the condition was noted. During this time he did not feel sick and until time of admission to the Infirmary the temperature was normal.

*Past history.* Measles, mumps and chickenpox.

*Family history* essentially negative.

*Physical examination.* Pharynx reddened, tonsils small but not acutely inflamed. Cervical glands were swollen but not acutely tender. No other glands palpable and other findings essentially negative.

*Course.* The patient ran a temperature for only four days and only once was it over 100°. The glands in the neck were not painful and the throat was only moderately sore. A throat smear showed the presence of Vincent's organisms but clinically the throat did not appear typical of an acute Vincent's infection. After discharge from the Infirmary he felt well and was able to resume training for basket ball. On February 11, the blood picture had returned to normal, although the Vincent's infection was still present.

*Hematology.*

| Date | R.b.c. | W.b.c. | Lymphocytes | Monocytes | Glandular leucocytes |
|---|---|---|---|---|---|
| 12/14/28 | 4.7 | 14,200 | 78 | 2 | 20 |
| 12/17/28 | | 10,000 | 75 | 2 | 23 |
| 12/19/28 | | 7,700 | 69 | 3 | 28 |
| 12/21/28 | | 6,300 | 65 | 1 | 33 |
| 2/11/29 | | 7,500 | 33 | | 67 |

Case 5. H. C. N., male student, age nineteen years, was admitted to the University Infirmary January 28, 1929, complaining of generalized aching, particularly in the back, soreness and stiffness of the neck. The illness began three days previous to admittance with headache and malaise. The next day he noticed soreness and stiffness in the neck. The following day there was swelling, particularly on the right side. He complained of no gastrointestinal symptoms, except loss of appetite. He had been in good health previous to this attack.

*Past history.* Measles, mumps, chickenpox, smallpox and pneumonia.

*Family history* essentially negative.

*Physical examination.* Nose slightly hyperemic. Nasopharynx hyperemic. Tonsils moderately enlarged, cryptic and red. No pus expressed. Posterior cervical glands on the right were swollen, tender and individual glands could not be palpated; on the left the glands were just palpable. Other findings were essentially negative.

*Course.* On January 31 the lymph glands in axilla were palpable. Inguinal glands enlarged and palpable. At this time patient stated he felt better and soreness in neck was less. February 2, spleen palpable. February 4, throat much worse, necrotic patches on left tonsil. Appetite poor, was nauseated and vomited. February 10, throat much improved. There was nothing characteristic about the temperature except that it was lower than one would expect from the symptoms. The highest temperature recorded on February 6 and 7 reached 102°. There were only three days in which it was above 100°.

*Hematology.*

| Date | R.b.c. | W.b.c. | Lymphocytes | Monocytes | Glandular leucocytes |
|---|---|---|---|---|---|
| 1/28/29 | | 2,500 | 64 | | 36 |
| 1/29/29 | | 5,300 | | | |
| 1/30/29 | | 6,500 | 74 | | 26 |
| 2/ 1/29 | | 8,000 | 82 | | 18 |
| 2/ 4/29 | | 16,800 | 77 | 3 | 20 |
| 2/ 7/29 | | 25,700 | 66 | | 34 |
| 2/ 9/29 | 5.8 | 13,300 | 60 | 3 | 37 |

Throat smear February 5, Gram-negative displococci two plus, Gram-negative bacilli one plus, and occasional Gram-positive bacillus. Wassermann negative. Throat culture, February 6, streptococci three plus and occasional Gram-negative coccus.

Case 6.* F. A. R., female student, age twenty years, was admitted to the University Infirmary April 27, 1930, complaining of sore throat accompanied with external pain and difficulty in swallowing. There were no other complaints. The illness began about three days previous to admittance with swelling on both sides of the neck accompanied by stiffness and soreness. In other respects the patient did not feel sick. She had been in good health previous to this illness.

*Past history.* Measles, whooping cough, and chickenpox.

*Family history* essentially negative.

*Physical examination.* Nasopharynx hyperemic. Tonsils out. Posterior cervical glands swollen and tender, more marked on the left than on the right. Inguinal glands palpable but not enlarged. Other findings essentially negative.

*Course.* On the third day after admission the sore throat became much worse. There was moderate prostration and the patient was markedly distressed. During the next three days the glands in the neck became more swollen and tender. The axillary glands were palpable and the inguinal glands were slightly swollen and tender. The local and general condition was very little improved until May 6, nine days after admission, and from then on the improvement was rapid. The temperature remained above 99° for seven days but was never very high, the highest recorded being 100.8° on May 1. On May 6 and 7 the temperature was normal but rose to 100° during the day, after which it was normal. On May 5, bleeding and soreness of the gums was noted and, although repeated smears were negative for typical Vincent's organism, an atypical fusiform bacillus was observed and a positive diagnosis was made. Subsequently a similiar diagnosis was made by a local dentist and the condition was removed after several weeks of treatment. At no time were the physical findings and temperature in accord with the subjective symptoms.

*Hematology.*

| Date | R.b.c. | W.b.c. | Lymphocytes | Monocytes | Glandular leucocytes |
|---|---|---|---|---|---|
| 4/29/30 | | 14,000 | 60 | | 40 |
| 4/30/30 | | 10,000 | 78 | | 22 |
| 5/ 5/30 | | 10,000 | 66 | | 34 |
| 5/14/30 | | 7,000 | 40 | | 60 |

The urine was negative. The Kahn test gave a doubtful reaction but was later reported negative. Widal was negative.

### DISCUSSION

The etiology of the disease is not known. Bacteriologic examination of the throat has shown no constant findings, the organisms found being the usual bacteria found in the upper respiratory passages. Cultures for diphtheria have been uniformly negative. Various writers, Longcope,[7] Cottrell,[9] Bloedorn and Houghton,[8] have reported finding Vincent's organisms in a large number of cases but they do not consider this the cause of the disease. The appearance of the inflamed tissue is not characteristic of Vincent's disease. Cottrell[9] states that he has repeatedly seen Vincent's tonsillitis with only cervical adenopathy without splenomegaly and with a polymorphonuclear leucocytosis.

Further, he states that he has never seen the infectious mononucleosis syndrome associated with Vincent's gingivitis. Vincent's organisms were found in two of our cases and the infection persisted after the symptoms of infectious mononucleosis disappeared and during this time the blood count returned to normal. Blood cultures and Wassermann tests uniformly have been negative, and animal inoculation of an excised gland has yielded no further information. Whatever the etiologic factor, the portal of entry is probably the tonsils and lymphoid tissue of the throat.

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* Case No. 6 was added after the paper was presented to the Lane County Medical Society.

In the epidemic form the incubation period is considered to be between five to twelve days, and most often seven to eight days. In an epidemic studied by Tidy and Daniel[2] the incubation period was ten to twelve days.

### SYMPTOMS

The onset of the disease may either be acute or gradual, as in many cases reported there was a prodromal period of a week or more before the acute symptoms set in. Usually there is malaise, chilly sensations, headache, sore throat, generalized aching and fever or feverishness. Often chills and sweating are seen and less often abdominal distress. In four of our cases the onset was abrupt and in two there was a prodromal period of over a week.

Enlargement of the lymph nodes is one of the constant symptoms of this syndrome and is most marked in the cervical glands. However, in a large majority of cases other glands, as axillary, epitrochlear and inguinal, participate in this adenopathy. Skiagrams of the chest have shown enlargement of the mediastinal glands and mention is made of the mesenteric. In this series three cases showed general adenopathy, one presenting a questionable enlargement of the inguinal glands, and in two cases only the cervical glands were involved.

Another, although not a constant finding, is the enlargement of the spleen which was observed in only one of our cases. In the epidemic form mention is also made of enlargement of the liver but I find no reference to this in the literature covering the sporadic cases. Mention by earlier writers is also made of abdominal distress and Carlson[3] et al mention abdominal distress and nausea and vomiting common at the onset, particularly in infants.

The cervical enlargement may be the first symptom noticed by the patient (as in four of our cases), or it may develop after one or more of the prodromal symptoms have set in. In other cases soreness of the throat will be noticed before the glands begin to swell. Often, however, this is not a prominent symptom and the only finding is a slight redness, without ulceration. Earlier writers on glandular fever have made quite a point of the mildness of the throat infection. Of our cases, Nos. 4 and 5 and 6 complained of sore throat, while No. 5 was the only one showing ulceration and this patient suffered severely from pain in the throat. Cultures from the throat did not reveal any significant findings. Patient No. 5 suffered one day from nausea and vomiting and was the only one of our patients to show any abdominal symptoms.

The temperature is irregular, being usually higher in the afternoon, but is not septic, ranging in our cases from 99° to 102.° but often it may go higher. The pyrexia may continue for a week or more, although in this series it was of short duration. At the height of the disease the patients are very uncomfortable and appear sick. The swelling in the neck is painful and swallowing is somewhat difficult. Malaise is more marked and all of the symptoms are aggravated during this period of several days.

As the temperature drops to normal the patient feels markedly improved and in a few days is able to go about his work. The acute swelling of the glands subsides but there is a longer period of time before all adenopathy disappears. Suppuration of the glands is a very rare occurrence and is only infrequently mentioned in the literature. In a recent epidemic reported by Carlson[3] et al, this complication occurred in eight of the seventy-nine cases which is a much higher incidence than is usually found. All of these cases were in children under five years. Cultures from each case yielded staphylococcus aureus hemolyticus.

Hemorrhagic nephritis is likewise mentioned, particularly by Tidy and Morley[1] who found it in 6 per cent of their cases. As compared with other statistics this is somewhat high and here again this is not mentioned in the sporadic cases.

The most striking change noted is in the blood picture which is constantly characteristic of this disease. There is in most cases a leucocytosis which commonly is between 11,000 and 20,000, although reported cases have shown a white count of over 20,000. While a leucocytosis is the rule, one may find a normal count but with the blood changes to be noted later. This was noted in two of our cases, although in case No. 2 the count might have gone higher if the patient had been under observation for a longer period of time. In case No. 3 the last examination was the highest and the blood was still pathologic, although clinically the patient was much improved.

The most characteristic change in the blood is the absolute increase in the number of lymphocytes or perhaps more properly in the hyaline leucocytes, since the increase is not alone in the small leucocytes but also in those not found in a normal blood smear. Besides the small lymphocytes and cells of the large mononuclear and transitional group there is found a group of mononuclear cells that do not appear in normal blood and that form the distinct group characteristic of this disease. The presence of this group of abnormal cells has been pointed out by Sprunt and Evans,[6] Bloedorn and Houghton[8] and others, but the most detailed study has been made by Downey and McKinley[10] who have recognized three types of cells in their cases. These cells belong to the lymphocytic series and show no signs of immaturity (on the basis of Pappenheim classification) that is found in cases of lymphatic leukemia.

Clinically all the cases were the same and no differentiation could be made on the basis of cytologic study. Their type 1 cells are the most common. They are not excessively large cells, being somewhat larger than a normal lymphocyte and vary in size and shape. The chromatin forms a coarse net work of heavy strands and masses which are not sharply differentiated from the parachromatin, giving the characteristic cloudy appearance of the lymphocyte. In some of the larger cells, there may be a slight tendency toward a more diffuse arrangement of the chromatin, but never sufficient to justify classification as an immature cell. The nuclei of the larger cells are frequently eccentric, lobulated or indented and many of the smaller cells have irregular nuclei.

The cytoplasm is characteristic, being very basophilic, much more so than the normal large lymphocyte or large mononuclear. The spongioplasm stains dark blue or slate blue, finely granular, or flaky material with a pale yellow background or hypoplasm which gives the cytoplasm a vacuolated or foamy appearance. The periphery of the cell may contain more spongioplasm, giving a darker appearance, and in the cells with indented nuclei the cytoplasm in the region of the indentation appears lighter, due to a relatively larger amount of hypoplasm in many of the cells, particularly in the large ones with azurophil granules.

Type 2 cells show less variation. The nuclei of these resemble plasma cells, differing in that they have more of a washed appearance, and the blocking is not so pronounced. The cytoplasm is less basophilic, there are fewer vacuoles, and there is not the foamy, spongy and stippled appearance of the type 1 cells. The amount of spongioplasm and hypoplasm is more nearly equal.

The type 3 cells occur in cases with more leukemic features than those described under types 1 and 2. These are rather large atypical cells somewhat similar to type 1, the cytoplasm is vacuolated, and quite basophilic in some cells. There is usually relatively more hypoplasm, but its distribution remains the same. About 1 per cent of the lymphoid cells contain a single vacuole with an azurophil rod, located within an indentation of the nucleus. Azurophile rods located in this manner have been reported in cases of acute leukemia. A few cells are found with a vacuolated nucleus, containing several nucleoli and in this respect resembling somewhat the leukemic cells. There are many intermediate cells between the cells with a more or less immature nucleus and those with a highly mature nucleus.

None of these cells gave the oxidase reaction and this has been the observation of other writers.

The cells in our cases correspond very closely to Downey's type 1, and this appears to be more frequently observed than either of the other two.

## DIAGNOSIS

This condition has most often been confused with acute lymphatic leukemia and probably cases recorded as recovered from this disease have in reality been cases of infectious mononucleosis. The diagnosis from leukemia should readily be made as there is never found the severe anemia, high leucocyte count, hemorrhages and marked prostration. The swelling of the glands is usually more acute and a careful study of blood smears shows the absence of immature cells characteristic of leukemia. There may be borderline cases, in which Downey's type 3 cells are present, but here again careful study of the blood and the clinical course will determine the diagnosis.

Agranulocytic angina is characterized by severe ulcerative angina, extreme leucopenia with a marked disappearance of granular elements, profound toxemia, unfavorable prognosis and with greater incidence in middle aged women. This syndrome should not offer great difficulty.

In Hodgkin's disease, which has been confused with this condition, there are premonitory symptoms of pruritis, with or without provocative cutaneous lesions and diarrhea, a slow symptom, less development of glandular adenopathy usually in the cervical region, and later like changes in other glands. After a longer or shorter latent period there develops fever, cachexia, anemia and various pressure symptoms, progressing to a fatal termination. Blood changes, although not pathognomonic, are suggestive and consist of eosinophilia, which is especially suggestive if associated with leucocytosis. Another change consists in a high degree of polynuclear leucocytosis. There may be an increase in the large mononuclears. Pathologic examination of a gland will definitely establish the diagnosis.

The histology of infectious mononucleosis is not distinctive and is characterized by a hyperplasia of all cellular element with a retention of the normal architecture of the node.

Other conditions, as mumps, typhoid, syphilis, and influenza, should be easily ruled out by a consideration of the symptoms and laboratory tests.

Cady[11] reports a case sent to the hospital as acute appendicitis and it was not until a blood count was done that the true nature of the disease was discovered.

The number of cases reported from various sections indicate that the disease is probably not so uncommon and often goes unrecognized. Careful consideration of the blood changes are necessary for a correct diagnosis.

### TREATMENT

Of treatment little can be said and it is entirely symptomatic. In our cases during the febrile period the patients were made comfortable with phenacetin and aspirin, and the use of hot and cold fomentations to the neck. Although various agents were used on the throat, as silver nitrate, argyrol, chromic acid and hot gargle of Dobell's solution, no improvement was noted until the disease had run its course. With the decline of the fever and of the swelling of the glands the throat symptoms promptly cleared up. One case, in which Vincent's organisms were found, had peroxide gargles and topical applications of chromic acid.

### CONCLUSIONS

In this article we have made no great distinction between infectious mononucleosis and glandular fever. From a review of the more recent literature on the subject it would appear that most writers claim them to be the same disease. In regard to the more distinctive symptoms there seems to be no great difference. Earlier writers failed to note blood changes but in epidemics studied in more recent years these have been observed that correspond to the findings described under infectious mononucleosis. The most striking difference is in the marked contagious aspect of the one (glandular fever), where several members of one family contract the disease and with a rather widespread incidence in a given locality. On the other hand, the type of cases described as infectious mononucleosis does not seem to be contagious, as no mention of contagion appears in the literature, and in our cases, although small in number, there is no evidence of contagion and no direct contact cases were noted. We offer no explanation nor have we seen any discussion of this observation in the literature.

We have reported six cases which we have diagnosed as infectious mononucleosis, characterized by a constant swelling of the glands of the cervical region and constant blood finding of an absolute increase in lymphocytes, which are present as normal cells, and also as a distinctive abnormal type of cell not observed in normal blood.

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**Plastic Repair of Inguinal Hernia.** Joseph A. Pettit, Portland, Ore. (*Journal A.M.A.*, Nov. 15, 1930), believes that better results may be expected if the fine principles of plastic surgery are applied to herniorrhaphies. Fascia is the dependable tissue in the herniorrhaphy. Marginal suturing does not prevent a tendency of attenuated fascia to split. On the other hand, complete plication gives a greater coaptating surface and gives a double fascial covering. The construction of the new canal minimizes, if not nullifies, the possibility of another peritoneal protrusion. The direction of the new canal does not create any sharp angulation of the cord, produces no constriction, and permits the greatest degree of overlapping or plication of the flaps. Careful construction and suturing of the flaps gives a maximum amount of "double layer fascia." A careful cleansing of the coaptated fascial surfaces favors a prompt cohesion and avoids what might be termed a "fascial pseudoarthrosis."

# GUARDING THE PILOT'S HEALTH

Russell Ahrens
SEATTLE, WASH.
Seattle Representative, Boeing System

Two factors are absolutely essential to the success of air transportation, a good airplane and a good pilot, and they are equally important. Just as the responsible air transport company of today governs its choice of aircraft with great care and strives to keep them in excellent shape, so does it exercise discrimination in the selection of its flying personnel, and provides for strict supervision of the pilot's health.

The importance of the well-being of mail and passenger pilots has prompted Boeing System, which operates the Seattle-Portland-San Diego and the San Francisco-Oakland-Chicago mail, express and passenger airways, to employ Drs. E. H. Padden and John Tamisiea as flight surgeons to safeguard the health of the company's pilots. These physicians periodically examine the fifty Boeing pilots with as much regard to details as the expert mechanics who conduct the rigid examinations of the planes and engines. Dr. Padden examines every month the pilots on the Boeing Pacific Coast airway and on the western division of the Boeing Transcontinental air route, as well as the flyers of the Varney Air Lines, the United Aircraft and Transport Corp. division, operating the Seattle-Portland-Salt Lake City route. Dr. Tamisiea supervises the health of the flyers on the central and eastern divisions of the Boeing Transcontinental line. The two Boeing routes are the longest mail-passenger lines in the United States, and over them the company flies in excess of ten thousand miles daily. It recently reached a mark of ten million miles of flight, recorded during the three years the company has been in operation.

Boeing System decided to supplement the regular semiannual examination, required by the Department of Commerce, by having its two flight surgeons conduct thorough examinations every month. With such a system any chance of accidents resulting from poor health of pilots is eliminated. The job of the flight surgeons is to keep the pilots in the air, in the finest physical condition. The physicians look particularly for minor ailments and small defects which might develop into major difficulties before the attention of the pilot was attracted.

One of the most common conditions among the pilot personnel is pilot's fatigue or air-staleness, which is neurocirculatory asthenia. This is occasioned by strain experienced in flying and results in flagging of physical energy, decrease of efficiency and development of nervous instability. It is not necessary for the flight surgeon to go into the neurologic examination every month, as this is thoroughly taken care of in the regular semiannual examinations prescribed by the Department of Commerce.

Testing coast pilot. Grover Tyler, veteran Pacific Air Transport pilot on the Seattle-Portland-Medford division of the coast airway, taking one of the tests in the Schneider index, being conducted by Dr. E. H. Padden, flight surgeon for Boeing System.

The Boeing physicians check the pilots for fatigue by means of the well known Schneider index, a painstaking series of tests perfected by Dr. Schneider and employed in all branches of the United States air service. This index is comprised of a series of blood pressure and pulse readings before and after exercise, and by a more or less intricate system of grading a definite score is obtained.

In the Boeing organization, a pilot showing a Schneider index below a score of ten is sent home for rest and ordered to return the following day. If the results of the second test are again low, the flyer is grounded and urged to devote his time to exercises and recreation. After a few days he returns in good physical condition, ready to fly. The game of golf is a particularly beneficial exercise for the flyers. A majority of the pilots have taken up this sport, and it is common to see them walk out to their planes for their regular flights, carrying a bag of golf clubs slung over their shoulders. All parts of the body are benefited by this exercise, and no part more than the nervous system. Bowling is also a very effective exercise recommended to the men.

The flight surgeons also conduct careful examinations of the eyes, for it is apparent that good eyesight is without question one of the most essen-

Plane and pilot are well-tuned machine. A perfect airplane flown by an imperfect pilot is an imperfect machine, reason officials of Boeing System. Thus all Boeing System pilots are examined monthly by two company flight surgeons. Both planes and pilots of the organization are kept in the finest condition. This photograph shows a Boeing System transcontinental air liner in flight near Mt. Rainier.

tial requirements of pilots. As nearly fifty per cent of the Boeing System daily mileage of 10,000 miles is flown between dusk and dawn, the eyes of every pilot are more carefully examined than if the flying were confined altogether to daylight. Of the nineteen flyers on the eastern division of the Boeing transcontinental airway, for example, it was found that seventeen read 20-15, better than normal, and that the remaining two read 20-20, perfect vision. Test for eyesight is conducted by a depth perception examination, and also a phorometer index of the visual range of the Boeing flyers.

Particularly painstaking is the examination of the retina, as a diseased retina causes a condition referred to as "night blindness." Liver disturbances of a somewhat complicated nature have a tendency to produce the same condition.

The flight surgeons also examine the ears, mouth and throat. The nose must be free from growths and the tonsils free from infection and normal in size. Abnormalities, such as would cause nasal obstruction, must be removed, for a pilot cannot be a mouth breather. The reason for this is that a mouth breather cannot satisfactorily expand the lungs. Diseased or enlarged tonsils must be removed as they interfere with proper breathing and are a source of sundry ailments. General physical ailments decrease a pilot's resistance, and his efficiency as well, and tend to make him less alert.

A careful cardiovascular examination is made by the Boeing flight surgeons. Under the present system of medical supervision of the Boeing System personnel, there is no chance of a pilot ever suffering from heart disease.

The Boeing company has found that, after four hours of flying per day, the effectiveness of a pilot tends to decrease. Consequently the schedules have been so arranged that the flyers never have more than a four-hour trip each day, with a day of rest every two or three days. It was also discovered that flying at high altitudes tires a flyer more quickly, and as a result the company planes are flown at a low, but safe altitude, insuring the pilot's highest efficiency.

The first task of the flight surgeon is to win the confidence of the pilots, to show them and prove to them that their problems are his problems, and that his objective is "to keep them in the air, not out of it," in the words of Dr. Padden of the Boeing organization. With an effective cooperation between the flight personnel and the flight surgeons, the health of the pilots will be kept in prime condition.

The success of the policy of monthly examinations in the Boeing System organization has led to the establishment of this system of physical examinations in the Boeing School of Aeronautics at Oakland. Every flying student is given a comprehensive flying examination and mentality study before he is allowed to register in the flying courses. They are also given a monthly examination similar to that conducted with the mail and passenger pilots. This factor has done much to make flying over the routes of Boeing System and at the Boeing School of Aeronautics safe and dependable.

NORTHWEST MEDICINE
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Devoted to the Interests of the Medical Profession of the Pacific Northwest

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# EDITORIAL

## A MENACE TO EXPERIMENTAL RESEARCH

No propagandists are more persistent and fanatical than the antivivisectionists. Their perversion of facts and the alleged inhuman procedures of scientific experimenters offer lurid tales that serve to excite antagonism and hostile attitudes in the public mind against scientific research which has resulted in the greatest blessings to mankind. These people are constantly active in efforts to suppress this form of investigation by legislative action. For some years these experiments have been prohibited by law in the District of Columbia, except in the Hygienic Laboratory and other government controlled and operated institutions.

At the last session of Congress a bill was presented both before the Senate and House of Representatives to "Prohibit experiments upon living dogs in the District of Columbia and providing a penalty for violation thereof." In the House the bill (H. R. 7884) was twice read, referred to the Committee on the District of Columbia, was reported out of that committee and is now on the calendar of the House. This report states, "The committee gave ample opportunity to the proponents and opponents to express their views and present their arguments, and feels that the testimony of the proponents outweighs that of the opponents and should be accepted." Exhibits submitted include a paper published in the Journal of the American Medical Association, listing the number of dogs that died from experimental heat-stroke. The contention of the proponents is included to the effect that, "The dog does not react in the same way as a human does, and therefore is not an accurate criterion for man in any form of experiment, and should not be subjected to such extreme pain and intense suffering as they are called upon to endure, when the benefits accruing to humanity are practically nil." This affords an example of the misstatements of facts which are continually presented by these opponents of scientific medical research. It is to be noted in this report from the Committee that nothing is included to support the contentions of the opponents; hence its bias is obvious.

At the recent Conference of Secretaries in Chicago this matter received considerable attention. The secretaries were urged to bring the matter before their county societies with the suggestion that the members get in touch with their respective members of Congress, to whom they may present facts concerning this important matter so that the representatives may defeat this bill when it is duly considered before the House of Representatives. If this were to be enacted into law, prohibiting experimental research in the District of Columbia, it would serve as a precedent which would doubtless be followed in many states where the antivivisectionists have been carrying on active campaigns against this important form of investigation. It was recommended that the activities of the antivivisectionists should be counteracted by a campaign of education. Personal attacks and heated replies to mendacious assertions were discountenanced, but it was advised that, whenever opportunity presented itself before commercial and civic bodies, correct information should be imparted, showing the monumental accomplishments made possible through animal experimentation, which have resulted in saving many lives and relieving mankind of untold suffering. At the same time the interested public should be informed that this is accomplished with a minimum of animal pain, every known method being utilized to render the lives of these animals comfortable and happy. One difficulty of this situation has been that the opponents of this form of research have been permitted wide and vociferous publicity, and their inaccuracies and false statements for the most part have been proclaimed without opposition. The time has arrived when the real facts should receive judicious publicity.

## TWO MINUTES, PLEASE

Surely not too much to ask of the busiest surgeon, when the abdominal contents have been exposed for investigation or cure of a chronic complaint, and this is the average time necessary to examine such organs as are brought within his ken. Truly the gastrointestinal surgeon should be the king of clinicians, if opportunity to study disease were the only qualification. Here is the one region where organs of the living patient may be seen and felt, and their integrity passed upon only after a sufficient scrutiny. Where else may one have the opportunity of listening to the patient's description of his symptoms, leading him by alert direction to point or disarm suspicion of one or another organ and then test the conclusion by actual observation of them. In this field most of our knowledge of the early history of disease has been the result of countless observations by surgeons, the evidence being sifted until the patient's story is frequently all that is needed for a correct diagnostic conclusion. But even now a lack of appreciation of the importance of a thorough exploration is all too common and many "silent" diseases are thoughtlessly overlooked or genuine guides have been unpardonably misunderstood, for when the patient has been crossexamined later or his story retold, the manifestations of disease have invariably been present. The "silence" has been a myth.

Recent hospital records have shown that within less than a year after an appendectomy through a small incision, a second laporatomy has divulged the cause of the original symptoms as due to a carcinoma of the hepatic flexure of the colon in one patient, obstructing bands at the same flexure in another, an ileocecal tuberculosis in a third, a large caseating mesenteric gland in a fourth and an inflamed Meckel's diverticulum in a fifth. In every instance actual and discoverable disease must have been present at the first operation. Medical literature abounds with reports of operable carcinoma incidentally uncovered in different portions of the colon during a casual examination.

Biliary colic due to cholelithiasis is usually correctly diagnosed but, where the distress in the epigastrium is severe and recurrent, with referred pain in the left shoulder, an associated splenic enlargement with adhesions to the diaphragm is almost a certainty. To the surgeon who is satisfied with the exposure and removal of a diseased gallbladder the splenic involvement will remain undiscovered and another example of the interrelation of morbid states is overlooked. An enlarged head of the pancreas is a frequent accompaniment of gallbladder infection; chronic appendicitis, duodenal disease and cholecystitis are a recognized trinity. Chronic duodenal ileus gives similar symptoms to disease of the gallbladder and stomach; enlarged mesenteric glands cause recurring abdominal pain. Deformities of the duodenum, ileum and colon, congenital in origin but productive of distress after maturity, are easily recognized and not rare in occurrence. The kidney may suffer from an ureteric obstruction and a hydronephrotic process may simulate a gastrointestinal complaint.

When normal appearing organs are observed and the fact duly recorded, such information may be useful when later an inquisitive clinician is seeking the explanation of a new or continued disorder. The surgeon's memory is an unreliable storehouse. With such an opportunity to elicit a careful anamnesis, to define the probability or certainty of disease in one or more organs, with complete exposure of the organs to corroborate or correct our conclusions, is two minutes really too much?

## THE CONVALESCENT HOME

In studying the cost of medical care, the committee having this work in charge has extended its investigations in many directions, some of which may be considered as indirectly connected with the main investigations. Corwin* has made a contribution in the study of institutional convalescence which has an important bearing on this study. One of the prime considerations in the cost of sickness is the expense incident to hospital care. In a large proportion of cases, both medical and surgical, the acute period of treatment continues for from ten days to two weeks, during which hospitalization with all its detailed attentions is a necessity. Thereafter, during the period of convalescence, these patients commonly need only general care and supervision. Their needs can be adequately provided in an institution at greatly reduced cost. The report states that the average cost for a hospital bed is five dollars per day, while at a convalescent home all necessary attentions can be provided at not over half of this sum. Therefore, the convalescent home provides a response to the threefold economic demand of clearance of hospital beds for acute cases, assistance for the impecunious sick in regaining health in a trying time and for the community the opportunity of employing the most efficient and least costly method of dealing with this serious aspect of the disease problem.

It is stated that in 1927 there were 194 convalescent homes, located in twenty-two states, with nearly 13,000 bed capacity. More than one-half of these convalescent beds were serving the population of New York City. At present there are about 300 convalescent homes in the United States, distributed among thirty-three states. It is not adequate treatment for the convalescent patient simply to be sent to a farmhouse with instruction to obtain an abundance of good food and fresh air. These patients need medical supervision until they have sufficiently recovered to care for themselves without the aid of a physician. Some large institutions can afford a resident physician, but in many cases they must depend upon the part time of a medical attendant.

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*Corwin, E. H. L.: Institutional Convalescence. Miscellaneous Contributions on the Costs of Medical Care. No. 1, Washington, D. C.

A great variety of patients are suitable for this sort of institutional care, among them being convalescents from alimentary, cardiac, renal or metabolic disturbances, those numerous conditions classed under general debility and certain types of neuromental conditions. This list could be greatly augmented from the experiences of any practitioner with a few years of practice. Unquestionably this method of relieving the high cost of sickness might well be considered and adopted in all the cities of our land. In some cases the convalescent home is established as an adjunct to the large, crowded hospital for the purpose of relieving the demands made upon it. It may be maintained as an independent institution for the care of convalescent and chronic patients. Here is an opportunity of offering some relief for the high cost of sickness.

## ANNUAL CONFERENCE OF SECRETARIES

Last month the annual Conference of Secretaries of Constituent State Medical Associations and Editors of Association Journals was held at headquarters of American Medical Association in Chicago. Our Northwest states were represented by F. D. Stricker, Portland, of the Oregon State Society; C. H. Thompson, Seattle, of Washington State Medical Association; J. N. Davis, Kimberly, retiring secretary of the Idaho Association, and H. W. Stone of Boise, newly elected secretary; and C. A. Smith of Seattle, representing NORTHWEST MEDICINE. The purpose of these meetings is to discuss problems common to the medical profession in all the states. It has been found that, although there may be some local modifications, the questions affecting physicians are the same in all sections. The unanimity of opinion is a striking factor when presented by men from the extremes of our land. On this occasion much discussion centered about the future relations of medical practice to the public and the state. Whether the situation prevailing in England and European countries is destined to be established among us is a question of vital interest. Some seem to believe a form of state medicine is inevitable. Personal observations of conditions in European countries do not offer an attractive setting for imitation among us. This question will undoubtedly become acute in the near future in many of our states. It will devolve upon the medical profession in various sections to be alive to the indications pointing to such a situation and they must be prepared to cope with it when its presence becomes imminent.

In Minnesota there has been an intensive development in cooperation between the county societies, public health and educational organizations. This was described in much detail. Its elaboration might be considered burdensome until it has been studied and digested. In listening to the essayist one could not but speculate as to whether the system and results obtained are any improvement on the development along these lines which has been carried out in Oregon by the state society. Undoubtedly the presentation of this subject will inspire its study in other states. The results described from the intimate association of these various interests were clearly presented and their adoption might be considered elsewhere.

An interesting discussion centered about the use of the radio for the dissemination of medical information to the public. As a result of a wide experience in this sort of work, the essayist suggested that it might be best, where few doctors are skilled in broadcasting, for all addresses to be delivered by one speaker, if such can be discovered, with a suitable voice and acceptable delivery. An indiscriminate selection of radio speakers is likely to produce unfavorable results among the listening public. Also it is best to conceal the identity of the speaker, thus avoiding the charge of self-advertising. How to suppress broadcasting by advertising practitioners and medical quacks provoked much discussion. Since these men often pay good sums for the privilege of thus enlightening the public, their suppression may entail financial loss to the radio interests. It was suggested that this question may be judiciously approached on the basis of eliminating procedures prejudicial to public health. Other subjects were considered that were of equal importance and interest. The papers presented at this meeting will be published in coming issues of the A. M. A. Bulletin. They should be attentively read by officials of all medical societies as well as others who have access to them.

# MEDICAL NOTES

## OREGON

Physicians in Legislature. Public health and medical interests will receive adequate attention at the next legislative session, since the following physicians were last month elected to the two branches. Dr. Joel C. Booth of Lebanon will represent the Fourth Senatorial District, Dr. W. Carlton Smith of Salem the First Representative District and D. I. U. Temple of Pendleton the Twenty-third Representative District. It is a matter of congratulation that these well known and trusted members of the medical profession have been chosen to perform this public service.

Academy of Medicine Officials. Last month the Portland Academy of Medicine elected the following officers for the ensuing year: President, Richard B. Dillehunt; first vice-president, J. R. Barber; second vice-president, C. J. Hoffman; secretary, Harold B. Myers; treasurer, A. G. Bettman; membership committee, Frederick A. Kiehle; library committee, Karl Metzloff.

The Oregon Pathological Society has been organized in Portland with a charter membership of thirty-five pathologists and clinicians. Plans for the organization were drawn up by a group of pathologists, including Drs. R. L. Benson, H. H. Foskett, W. C. Hunter, C. H. Manlove and F. R. Menne. Meetings will be held on the second Monday evening of each month. Dr. F. R. Menne, head of the department of pathology, University of Oregon Medical School, was elected president and Dr. Warren C. Hunter, assistant professor of pathology in the same institution, secretary-treasurer.

Police Cannot Run Hospital. Recently it was determined by the Portland Chief of Police that the emergency hospital was to be managed without interference from his department. The head of the women's protective division presumed to make recommendations concerning the management of this institution. The order was given that members of the police department were to be subordinate to physicians and nurses connected with the city health department.

Drugless Doctors Can Treat Corns. Dr. F. B. Stricker, state health officer, was recently informed by the attorney general that naturopathic physicians can treat corns if drugs are not used. This official stated that the law authorizes naturopaths to apply their treatment to the human body which includes "that part of the anatomy which furnishes fertile ground for corns."

Former Medical Missionary Honored. Dr. J. Hunter Wells, assistant health officer of Portland, has been distinguished by having his name attached to a dispensary at Pyengyan, Korea, which is designated, "The J. Hunter Wells Memorial Dispensary." He was for twenty years a medical missionary in Korea and this distinction is for the faithful work which he accomplished in that land. The building is a two-story brick structure equipped for laboratory and other medical work.

Appointed City Physician. Dr. Darrell C. Bollman has been appointed assistant city physician of Portland. He has recently been in charge of the police emergency hospital.

Dr. Frank I. Ball of Portland received serious injury to the brain last month, when his automobile collided with another on the highway. At last reports he was still in a critical condition.

Dr. Fred C. Hill, recently from Rochester, Minnesota, has located at La Grande, where he will be associated with Dr. A. L. Richardson.

## WASHINGTON

Re-elected to Congress. At the election last month Dr. John W. Summers of Walla Walla was re-elected to the national House of Representatives. He enjoyed the special distinction of running for this office without competition, since no other candidate appeared to contest his election. The long period during which he has represented his district is evidence of the confidence which his constituents have in his ability and integrity.

Physicians Elected to Legislature. At last month's election in Washington, Dr. Walker J. Taylor of Port Angeles was re-elected to the Senate. This will be his second term of four years service. Dr. H. C. Watkins of Hoquiam was re-elected to the House, this being his second term of service. The presence of these men in the Legislature will insure careful and adequate consideration of all matters pertaining to public health.

Addition to Hospital. The Oakhurst Tuberculosis hospital at Elma has been enlarged by the addition of a building of two stories, thirty-one by sixty-four feet in dimensions, constructed at a cost of $12,000. It is intended for the use of employees and will accommodate twenty-five men and women.

Nurses Home Dedicated. The new nurses' home at Providence hospital, Everett, has been completed at a cost of $100,000. Its dedication has been announced for this month. It is a three-story building of L type, each wing being one hundred twenty-five by forty-four feet in size. It will contain between eighty and one hundred beds.

Hospital to be Modernized. The U. S. Veterans' Hospital at Walla Walla is being remodeled to the extent of an expenditure of $30,000. Ward 69 is a relic of the old Fort Walla Walla. It is to be modernized to fill an important need for the patients of this institution.

President of Garden Club. Dr. E. Weldon Young of Seattle has been elected president of the Washington Arboretum and Botanical Gardens Society. The acquisition of such a botanical garden has been under consideration for some time.

Dr. M. T. MacAvelia, recently from Atlanta, Georgia, has located at Burlington, where he will be associated in practice with Dr. H. E. Cleveland.

Dr. I. M. Cohn, after spending a year of study in European cities, has returned to Seattle, where he will continue practice as a dermatologist.

Dr. I. A. Kennedy, a recent resident of Seattle, has located for practice at Washougal, where he will be associated with Dr. W. R. Kildee.

Appointed to Examining Board. Dr. A. Poska of Seattle has been appointed by Governor Hartley as a member of the state medical examining board. He succeeds Dr. E. C. Ruge who recently resigned.

Dr. Robert F. Foster, a recent graduate of Northwestern Medical College, has located at Longview, where he becomes resident physician of the Longview Memorial hospital.

Dr. C. A. O'Connor, who has practiced at Chewelah, has left that locality and located at San Francisco.

Wedding. Dr. John T. Abraham of Wenatchee was married last month to Miss Evelyn Wilson of Sault Sainte Marie, Canada, the wedding taking place in the latter city.

### IDAHO

New Hospital Appointments. Last month new staff appointments were made at the annual meeting of the L. D. S. hospital at New Orleans. Dr. Harry Wilson was appointed chairman of the executive staff to succeed Dr. J. W. West, while Dr. J. R. Mellor was appointed to succeed Dr. Wilson as chairman of the associate staff.

Dr. F. A. Pittenger of Boise has returned from a trip to China, Japan, Korea, and the Philippines. He reports all of China, except at the seaport cities, in a condition of distress and suffering, due to constant turmoil from communistic propaganda and banditry. He was impressed with the tragic condition of the colony of intellectuals at Harbin who were driven out of Russia at the establishment of the Soviet regime.

Dr. D. W. Palmer, recently of Clarkston, Wash., has located at Lewiston, where he will be associated in practice with Drs. Crampton and Johnson.

Dr. John W. Hamer, who has been practicing in Middleton for some time, has located for practice at Fairfield, Camas County.

### OBITUARIES

Dr. Samuel F. Sharp of Athena, Ore., died October 28, after a long illness from heart disease, aged 83 years. He was born in Millersburg, Ohio, in 1848. After graduating from the University of Michigan, he received his medical education at Jefferson Medical College, Philadelphia. He located for practice at Athena in 1879. In spite of ill health for a number of years he continued in practice until a few months ago. His kindly and sympathetic nature endeared him to the entire community.

Dr. Prosser Elwin Clark died at Portland, Oregon, November 10, aged 46. He was born in 1884 at Clarksburg, Indiana. He graduated from Indiana Medical School and took postgraduate work at the Universities of Chicago and Harvard. He located in Portland about five years ago. For the past four years he has been instructor in clinical medicine at the University of Oregon Medical School.

Diagnosis of Laryngeal Disease. Chevalier Lawrence Jackson, philadelphia (*Journal A.M.A.*, Nov. 1, 1930), says that hoarseness, the most common symptom of laryngeal disease, always calls for careful diagnostic study. Too often patients with this complaint are sent away with a casual diagnosis of "laryngitis." As a result, the patient with early and easily operable cancer, or incipient tuberculosis, is allowed to go on for months without an accurate diagnosis and appropriate treatment. He reports on a series of cases which demonstrates the value of fluoroscopic and roentgenographic study of the neck in the diagnosis of laryngeal lesions.

# REPORTS OF SOCIETY MEETINGS

## OREGON

### POLK-YAMHILL-MARION MEDICAL SOCIETY

Pres., G. C. Knott; Secty., W. W. Baum

A regular meeting of Polk-Yamhill-Marion Medical Society was held at Salem, November 4.

The following program of papers was presented:

"A New Technic in Adenoidectomy," by Dr. M. C. Findley.

"Signboard Quotations on Acute Inflammatory Conditions of the Eye," by Dr. R. Lee Wood.

"Double Metastatic Carcinoma of the Choroid. A Short Review of the Literature and Case Report," by Dr. F. E. Brown.

Miss Bertha Hallam, Librarian of the University of Oregon Medical School library, gave a short talk regarding the service offered to the physicians of the state by the library.

## WASHINGTON

### KING COUNTY MEDICAL SOCIETY

Pres., D. H. Houston; Secty., A. J. Bowles

A general meeting of King County Medical Society was held November 3 in the Auditorium of Medical-Dental Building, Seattle, President Houston presiding. One hundred five members were present. Minutes of previous meeting were read and approved.

A portrait of Dr. Casper W. Sharples, painted by Muehlenbeck, a gift from Dr. A. H. Peacock, was presented to the Society, Dr. C. B. Ford making the presentation address. Dr. Sharples replied with suitable remarks.

Dr. Norman W. Clein read a paper, "The Successful Treatment of Cerebral Hemorrhage in the New-born." This condition is not at all uncommon and should be recognized early. In premature infants fifty per cent of deaths are due to this cause. Cerebral hemorrhage may appear as cortical, subcortical or meningeal irritation. The diagnostic signs are cyanosis, apathy, failure to cry, difficult respiration, difficulty in swallowing liquids. Least common symptoms are convulsions and bulging fontanel. Instrument delivery is not a common cause. Differential diagnosis should exclude aletectasis, congenital heart disease and syphilis. Cisternal puncture is the treatment of choice. Prognosis is good if the case is treated within the first twelve hours. The paper was discussed by Dr. G. W. Swift.

Dr. G. S. Peterkin introduced Dr. Albert Van Dusen, professor of sociology at Syracuse University, who read a paper on the sociologic aspect of birth control.

Dr. Souren Tashian read a paper, "Clinical Significance of Crypts of Morgani." The embryology and anatomy of this condition was reviewed. The importance was stressed of digital and proctoscopic examination to discover early cancer of the rectum in operative condition. These crypts often harbor fecal matter and swarms of bacteria which may act as foci of infection. When torn they form painful fissures. The paper was discussed by Dr. Crookall.

Mr. George F. Cotterill of Seattle Port Commission spoke in favor of initiative measure No. 57, the reapportionment bill.

Drs. T. H. Mitchell and A. Poska were elected to membership in the society.

A meeting of the Medical Section of the society was held November 10, with Dr. Frederick Slyfield in the chair.

Dr. H. H. Sherwood reported a case of atophan poisoning. Dr. J. W. Shaw discussed "Lesions of the Oral Mucosa." These are common and are distinct aids in diagnosis of constitutional and vissereal disease.

Dr. Hal Downey, professor of anatomy, University of Minnesota Medical School, delivered an address on "Some Hematological Problems and Their Importance for Diagnosis." The relationships of blood cells were discussed and it was stated that lymphocytes regenerate by division of their own kind without differentiation from a stem cell, usually considered as the lymphoblast. The nature of leukemia was considered and the different types of both myelogenous and lymphatic were discussed. The subject of anemia was presented and the different types differentiated.

## KLICKITAT-SKAMANIA COUNTIES SOCIETY

Pres., Allen Bonebrake; Secty., J. B. Barber

Klickitat-Skamania Medical Society held a meeting at White Salmon, October 30. All the six members, living in two counties, were present.

Dr. A. E. Anderson, President of Washington State Medical Association, gave an address on "Medical Economics." Dr. Charles A. Hunter of Tacoma, read a paper on "Surgical Diagnosis," and Dr. Christian Queveli of Tacoma, presented a paper, "Fluoroscopy of the Heart and Aorta."

Miss Helen Wilcox, secretary of Washington State Public Health League, discussed the work and purposes of her organization.

The subject of county hospitals was considered. Dr. F. H. Collins, county health officer of Klickitat county, offered information regarding the cost of construction and equipment.

## PIERCE COUNTY MEDICAL SOCIETY

Pres., D. M. Dayton; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in the Rose and Gold Room of the Winthrop Hotel, Tacoma, November 11, Dr. D. M. Dayton in the chair. Minutes of the previous meeting read and approved.

### PROGRAM

"Spastic Ileus," Dr. C. H. Aylen, Puyallup. It was stressed that spastic ileus is usually not diagnosed except at operation or autopsy. A case was reported of a girl nine years old who had been struck in the abdomen by the fist of a boy. She vomited every day for a week, but had very little pain. At operation six or eight portions of the small and large bowel were found contracted. The only pathology to be found was a small partial twist of the ileum. Immediately on straightening this bowel all constriction disappeared. The patient made an uneventful recovery. The paper was discussed by Drs. H. J. Whitacre, W. W. Mattson and E. D. McCarty.

"Acute Infections of the Palm of the Hand," Dr. W. B. Mitchell of Sumner. Attention was called to the necessity of an accurate knowledge of the anatomy of the hand, that proper diagnosis and treatment might be carried out. The paper was discussed by Drs. H. G. Willard and H. J. Whitacre.

"Friendly and Unfriendly Relations Between Country and City Doctors," Dr. F. L. Scheyer of Puyallup. This was a timely paper, dealing with fair and ethical relations between doctors. It was commended and discussed by Drs. C. F. Engels, P. B. Swearengen, C. H. Aylen, W. B. Penney, D. H. Bell and C. H. Doe.

## SNOHOMISH COUNTY MEDICAL SOCIETY

Pres., H. W. Bortner; Secty., R. B. Townsend

Snohomish County Medical Society held its regular monthly meeting at Everett, November 4.

The following officers were elected for the ensuing year: President, E. M. Adams; vice-president, H. J. Greer; secretary, R. B. Townsend; treasurer, O. A. Thomle. Delegates to the state medical association meeting: E. C. Leede and C. L. Hoeffler. On the board of censors, W. D. Smith.

Dr. A. P. Duryee read the paper of the evening.

## WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., F. M. Campbell; Sec'ty., G. C. Daniels

The regular meeting of Walla Walla Medical Society was held in Walla Walla, November 12, at Marcus Whitman hotel, where a dinner preceded the meeting.

### PROGRAM

Dr. Charles B. Ward of Spokane gave an address on "The Treatment of Cancer with Radium and Roentgen-ray."

Dr. W. J. Pennock of Spokane gave an address on "Surgery of the Urinary Bladder," while Dr. M. M. Patton of Spokane discussed "Tumors of the Breast.".

## YAKIMA COUNTY MEDICAL SOCIETY

Pres., P. J. Lewis; Secty., R. L. Ross

The regular meeting of Yakima County Medical Society was held jointly with the Yakima Dental Society, at Yakima, November 10, following a dinner at the Com mercial Hotel at 6:30 p. m. There were thirty-three members of the medical society and twenty-five members of the dental society present. A brief business meeting was followed by a program.

A paper was read by Dr. Robert L. Benson of Portland, "A Hopeful View of Asthma," and one by Dr. W. Claude Adams of Portland, on "Oral Problems of Equal Interest to the Physician and Dentist," with a plea for better cooperation. The papers were of great interest and well received, as manifested by a generous discussion.

This was the first joint meeting of the physicians and dentists promoted in the interests of better acquaintance and understanding and was voted a marked success.

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USE OF MECHANICAL MEASURES IN TREATMENT OF OBSTINATE EDEMA. In eight cases of extensive edema, mostly the result of congestive heart failure and resistant to medical therapeutic measures, Edward F. Bland and Paul D. White, Boston (*Journal A.M.A.*, Nov. 15, 1930), have employed Southey's tubes inserted into the edematous subcutaneous tissue of the legs or scrotum. In two of the patients the results were strikingly beneficial, following the removal of 16 liters in the course of two days in one case, and of 9 liters in three and one-half days in another. In three patients there was moderate relief; in one case only slight improvement was noted; the remaining two patients were not relieved.

# BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

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Laboratory Medicine: A Guide for Students and Practitioners. By Daniel Nicholson, M.D., Assistant Professor of Pathology, University of Manitoba, etc. Illustrated with 108 Engravings and a Colored Plate. 433 pp. $6.00. Lea & Febiger, Philadelphia, 1930.

This work is not purely a manual of laboratory technique, with a sketchy reference to the clinical significance of the findings, but rather begins at the other end, and, considering first the outstanding clinical symptoms in various diseases, tells what laboratory procedures should be followed to aid in arriving at a definite diagnosis. As an example, under the heading "Choice of Tests to Determine the Cause of Abnormal Hemorrhage," the common causes are enumerated, followed by the suggestion that the following tests be done: (1) Count of blood platelets, red and white cells, (2) time of clot contraction, (3) Hess capillary test, (4) bleeding time, (5) Coagulation time, (6) icterus index. Reference is given by page number to where the technic may be found and the interpretation of results. How many physicians are there who would know what tests were indicated and the meaning? Yet the diagnosis in this instance rests largely on the laboratory findings.

In the chapters which follow there are concise, lucid accounts of the technic of various tests, with the normal and abnormal values, and the significance of the latter. The reader is not confused by having a great many varied technics presented, from which a selection must be made. One or at most two tests, which the author has found most suitable and applicable, are described. Although the volume is of just over 400 pages, all tests of value are described, and in addition there are a few of which knowledge is scanty and yet are logical in apparent value. It will be of great value for one to have a copy of this book at hand, greater for the clinician than one engaged in laboratory work. Cefalu.

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Mental Aspects of Stammering: By C. S. Bluemel, M. A., M.D., L.R.C.P. (Lond.), M.R.C.S. (Eng.) Clinical Instructor in Neurology at the University of Colorado School of Medicine, etc. 152 pp. $2.50. The Williams and Wilkins Co., Baltimore, 1930.

A book written primarily for school use, also for the stammerer to use for self-training. It consists of two parts, the first presenting the author's conception of the mental cause of stammering, the second giving his methods of mental training for correcting the impediment. Stammering is first considered as an impediment of thought with the impediment of speech as the resulting symptom. Following this a few pages are devoted to elementary psychology, it being applied to the subject of the thesis. In a chapter on the psychoneuroses the author speaks of thought disturbances as affecting numerous functions besides speech, and finds "stammering" in swallowing, breathing, walking, using various instruments, writing, etc. Reversing the analogy, why not speak of stammering as a tic or habit spasm?

The remaining two-thirds of the book are devoted to the technic of the methods of treatment which the author states are effectual with children, but of less value with adults. The book is simply and clearly written, and contains numerous photographic reproductions, illustrating the author's method of therapy employed in the school room. To stammerers and those interested in the treatment of stammering this little volume is heartily recommended.

Price.

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A Treatise on Orthopedic Surgery. By Royal Whitman, M.D., M.R.C.S., F.A.C.S., Consultant to the Hospital for the Ruptured and Crippled, to St. Giles and St. John's Guild Hospitals, etc., New York. Ninth Edition. Thoroughly Revised. Illustrated with 981 engravings. 1085 pp. $10.00. Lea & Febiger, Philadelphia, 1930.

As orthopedic surgery is concerned primarily with bodily mechanics, the prevention and correction of deformities and the conservation of locomotion, the author has classified his subjects according to his personal and hospital experience and has alloted space according to the importance of each subject. It is impossible to make a convenient classification, as the material is drawn from every department of medicine and the subjects are unrelated in etiology and pathology, as so-called orthopedic surgery has very ill defined boundaries and the English definition of this form of special surgery seems to be the soundest. The author is always mindful that the majority of deforming diseases are first seen by the general practitioner and consequently has gone to some pains and perhaps undue detail in explaining various methods of examination and points to be looked for in the parts that are examined, always with one view in mind, an early diagnosis, this being a natural sequence of preventive treatment.

In the beginning, is given a very simple and most adequate description of tuberculosis of the spine, various methods of treatment, their advantages and disadvantages, both conservative and operative, and their faults as well as their advantages. Likewise is considered every other form of bodily mechanics that is justly classified as orthopedic. The descriptions and descriptive terms are unsurpassed and are characteristic of no other author in being expressive and simple. No doubt he has purposely left out a number of older methods of treatment which are now obsolete and has included the more recent advances in this particular specialty, yet never losing sight of the conservative as well as the newer operative methods. The general trend of orthopedics during the last century has been along the lines of surgical means which greatly shortens the period of treatment. This is indeed the work of a master and, if one will stop and review the original edition and compare it with this, the work demonstrates very clearly the advances in both scope and methods of this branch of surgery.

McLemore.

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Laboratory Pediatrics: Clinical Pediatrics, Volume XX. By John D. Lyttle, M.D., Assistant Clinical Professor of Diseases of Children, College of Physicians and Surgeons, Columbia University, New York, etc. Illustrated. 189 pp. D. Appleton and Company, New York and London, 1930.

The author states in the preface that this volume was designed primarily for the general practitioner rather than the pediatrician or the advanced laboratory worker. It is his opinion that many of the tests commonly performed by hospital technicians are sufficiently simple to be satisfactorily carried out in the physician's own office laboratory.

The individual chapters are devoted to descriptions of routine tests on urine, blood, sputum, feces, gastric contents and cerebrospinal fluid. The chemical and bacteriologic examination of breast and cow's milk are described. In the chapter on "Blood Chemistry in Pediatrics" there is a valuable introductory section on the technic of venepuncture and sinus puncture. This is followed by descriptions of the estimation of nitrogenous and mineral compounds in the blood. Normal values are compared with the deviations found in various metabolic diseases. The book is concise and practical and should prove a distinct aid to any physician who desires to perform the laboratory work incident to the practice of clinical pediatrics. OLMSTED.

A TEXT-BOOK OF PATHOLOGY. Edited by E. T. Bell, M.D. Professor of Pathology in the University of Minnesota, Minneapolis. Illustrated with 316 Engravings and 2 Colored Plates. 627 pp. $8.00. Lea & Febiger, Philadelphia, 1930.

Six associate editors in the various branches of pathology contribute to this volume. It has two distinct advantages over the average textbook. First, it is very concise and includes a clear description of the essential changes in an organ; second, the subject matter adheres closely to the outline. This book will serve excellently as a rapid reference work or an outline of the ordinary pathologic lesions occurring in any organ. Of necessity, a single work cannot go into too great detail in the discussion of these lesions. The chapters on blood written by Hal Downey are particularly good. NICKSON.

THE PSYCHOLOGY OF CHILDHOOD: By Edgar James Swift, Ph.D., Professor of Psychology, Washington University. 431 pp. $3.00. D. Appleton & Co., New York and London, 1930.

One closes this book with the sustaining feeling of the author's sanity. He admits he doesn't know everything about child psychology; he has no sure cure for all the ills of the mind and personality, and even admits that an intelligent old maid or bachelor may be better equipped to observe and suggest than an harassed parent. In other words, one needn't lay an egg to be qualified to judge between a good and a bad one. Best of all he is not a propagandist. He credits the contributions of Freud and Watson without believing they have propounded an all-saving gospel. He believes the mental life is not one long series of sex imaginings, and as to behaviourism he is not yet ready to believe that by proper nurture one can gather figs of thistles.

The whole child is the central thought; as Adolph Meyer would say, "the integration of the individual as a whole." He believes that the future personality pattern is laid down in infancy and early childhood, and the problem is one of "changing tendencies and unscrambling fears," never forgetting that the child study of this period is most often parent study. He pictures a millenium in which inefficient parents will be discharged like inefficient teachers.

In the moral and social education of the child, the behaviour of parents and the ethics of the playground are powerful forces. The intelligent child will be guided by what he observes and experiences more than by what he hears, particularly if his tympanic membranes have been dulled by incessant "don'ts."

In the psychology of discipline one must distinguish it from punishment. Discipline consists in "producing and maintaining habits of thoughtful behaviour." The necessity of punishment is a tacit admission of failure of parent or teacher, but when necessary, it should be direct, not vengeful, often heroic and should leave no sense of injustice. To the pediatrician, who often wonders what the psychologist is about, it is refreshing to have one admit that the current intelligence tests are a measure of information and school attainments rather than native ability. It is well summed up in the statement that "no test to determine intelligence is valid unless the individual tested has had a reasonable opportunity to learn about various elements involved in tests and has also been interested in learning."

The reviewer will unhesitatingly recommend this book to parents interested in the mental growth and training of children. McCOWN.

JOHN MARSH, PIONEER. The Life Story of a Trail-blazer on six Frontiers. By George D. Lyman. Illustrated, 394 pp. $3.50. Charles Scribner's Sons, New York, 1930.

Here is presented a sketch of the life of a man who had an active part in the early development of California. Born in Massachusetts, he was destined by his parents for the ministry. After graduating from Harvard College in 1823, he taught school while reading medicine with a physician. In order to increase his finances, he accepted the position of teacher in an officer's family at a fort on the frontier of Minnesota. Here his medical knowledge was supplemented under another physician. He developed an intense interest and knowledge of the Indians, forming an attachment for a beautiful half-breed Sioux, from whom was born a son. He served for a time as Indian agent, having many thrilling experiences. After the death of his beloved Indian companion, he got into difficulties that caused him to flee from this section and he appeared in California, while that territory was under the Mexican government. He purchased an immense tract of land in the San Joaquin valley, where he developed the reign of a cattle king. Being possessed of limited funds at the outset, he decided to practice medicine. As this would not be permitted except by license from the Mexican government, he offered his Harvard B. A. degree as proof of his qualifications. Since none of the authorities could read Latin, they concluded a man must possess medical knowledge who possessed such a learned document. Thus he became the first medical practitioner in California. His fees were collected in cows, fifty of these being the minimum fee for a labor case. Although he had a limited knowledge of drugs, quinine was his main stay and he was successful in the use of the scalpel. This history relates many stirring experiences with cattle thieves and other robbers, following the trail of the Argonauts of '49. After marrying a lady in California, he built a residence of stone and home-made bricks, said to be the most imposing structure in the state. It remains a monument widely known as Marsh's castle. Anyone wishing to spend the time to read a fascinating book will be satisfied with this tale of a medical practitioner with most diversified experiences.

MINOR SURGERY AND BANDAGING: By Gwynne Williams, M.S., F.B.C.S. Surgeon, University College Hospital, London. Twentieth Edition with 262 illustrations. 445 pp. $3.50. F. A. Davis Co., Philadelphia, 1930.

The first chapters deal with examination of patients, methods of sterilization and preparation of various compounds used in minor surgery. Concise formulas are given, not in too great a number, and terse directions for each process. Preparation of patients for operations is succintly outlined, none of the minor points being omitted. The plan of the operation comes next, the role of each person in the surgery being briefly pointed out. Various special instruments are mentioned, as also sutures and drainage of wounds. Postoperative care is concisely treated and complications are included. The care of traumatic wounds is discussed, also bruises, sprains, burns and other accidental injuries. The treatment of hemorrhage is clearly stated. A short chapter deals with the recognition of major surgical conditions and the immediate procedure therein. While not minor surgery, this does not seem out of place.

Minor surgery comprises such procedures as laryngeal intubation, spinal puncture, aspirations, infusions, transfusions, incisions, amputations and herniotomy. Classic methods are outlined with minor original points, and in such a simple way that the knowledge of how to do these things seems more accessible than usual. Unlike most discussions of bandaging, its description avoids a bewildering multiplicity of bandages and diagrams. A neat, effective bandage is always to be desired and herein the making of such is pointed out with interesting ease.

In the care of fractures all methods are simple, the directions complete even as to less important points. At the end is a table giving the periods for disability for various fractures and presenting the English schedule. Dislocations and their reduction are briefly discussed. Orthopedic appliances are described, and their disadvantages as well as merits pointed out. Inhalation anesthesia is described, English apparatus being pictured and described. Chloroform, while listed by the author as one of the more dangerous anesthetics, is given a good deal of space. Designed for the use of house surgeons, dressers and junior practitioners, the book deserves wide recognition.

La Violette.

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Physiology and Biochemistry in Modern Medicine. By J. J. R. Macleod, M.B., LL.D., D.Sc., F.R.S., Regius Professor of Physiology in the University of Aberdeen, Scotland, etc. Assisted by Roy G. Pearce, A. C. Redfield, N. B. Taylor, and J. M. D. Olmstead and by others. Sixth Edition. With 295 Illustrations, including 9 Plates in Colors. $11.00. The C. V. Mosby Co., St. Louis. 1930.

The fact that the first edition of this work appeared in 1918 and the sixth in 1930 indicates both its popularity and the rapid advance in the application of physiology and biochemistry to medicine. The first edition brought together those portions that had been found most useful to the clinical worker. In the fifth edition, in response to requests from teachers of physiology, there were additions to make it a suitable text on physiology for students of medicine. The sixth edition brings the text up to date.

With the rapid increase in laboratory procedures in medicine there has been less and less of this work done by the clinician. He is relying more on reports from the laboratory worker and frequently draws unwarranted conclusions from such reports because of hazy ideas of fundamental principles involved. For the same reason he also asks the laboratory for work that has but little practical value. The last years in medical school are so crowded with clinical work that there is little time left for the student to apply the knowledge of fundamentals acquired in the first years, and he soon learns to depend on reports from the laboratory rather than upon first hand knowledge.

These conditions make books on the application of physiology and biochemistry prime necessities to the practitioner. This book is, however, much more than an application of laboratory work to medicine. The chapters on digestion, absorption, metabolism, respiration in the lungs and beyond the lungs, circulation and excretion of the urine contain much that can be applied at the bedside to the satisfaction of both patient and physician. This is the most satisfactory work on the subject available and merits a place within easy reach and in the study of every practitioner.

Griswold.

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A Textbook of Histology. By Harvey Ernest Jordan, A.M., Ph.D. Professor of Histology and Embryology, University of Virginia. With Five Hundred and Ninety-four Illustrations in the Text and Four Plates. 857 pp. D. Appleton and Company, New York and London, 1930.

The earlier textbook of histology was prepared by Harvey Ernest Jordan and Jeremiah S. Ferguson with about 300 original illustrations and others borrowed from various sources. This text has been thoroughly revised through the five previous editions and new material and illustrations have been added in order to bring the volume up to date. The text is divided in three main portions; first, the textbook on histology of 719 pages; second, the chapter on histologic technic which is well done with complete directions for laboratory work. This makes a complete textbook on histology. It is adequately planned for use by medical students.

Mosiman.

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Affections of the Eye in General Practice. By R. Lindsay Rea, B.Sc., M.D., M.Ch. F.R.C.S. Surgeon to Western Ophthalmic Hospital, London, etc. With Seven Colored Plates and Thirty-three Illustrations. 155 pp. Lea & Febiger, Philadelphia, 1930.

This book comprises a series of papers that the author has written from time to time concerning affections of the eye. It is not a textbook on ophthalmology and probably will not interest the ophthalmologist. The general practitioner, however, will obtain from it information concerning the ordinary dsieases of the eye stated clearly and concisely.

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Surgical Clinics of North America: (Issued serially, one number every other month.) Volume 10, number 5, (Pacific Coast Number—October, 1930) 271 pages with 136 illustrations. Per Clinic year (February 1930 to December 1930.) Paper, $12.00; Cloth, $16.00. Philadelphia and London.

This volume, designated Pacific Coast number, offers clinical reports from surgeons in California, Oregon, Washington, British Columbia and Hawaii. Its special interest to the section served by this publication is suggested by the names of the following contributors: From Oregon appear reports from J. E. Else, W. B. Holden and R. E. Watkins of Portland. Washington contributors include B. T. King, G. W. Swift, A. O. and R. H. Loe of Seattle; S. L. Caldbick and R. E. Hoffstadt of Everett; A. A. Matthews of Spokane and A. W. Taylor of Ellensburg. These contributions cover a variety of subjects, which are presented in the usual attractive manner characteristic of this publication.

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A Primer for Diabetic Patients: By Russell M. Wilder, M.D., Professor and Chairman of the Department of Medicine, University of Chicago Clinics; Formerly Head of the Section on Nutrition, Division of Medicine, Mayo Clinic. Fourth Edition, Revised. 138 pp. Philadelphia and London. W. B. Saunders Company, 1930. Cloth, $1.50.

This booklet is intended to offer patients a brief outline of the treatment of diabetes with diet and insulin. It also includes directions and charts for the use of physicians in planning diet prescriptions. Every patient a subject of this disease could profit by the study of a book of this character and this is commended for that purpose.

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The Medical Record Visiting List for 1931. Contents: Calendar, July 1929-June 1931. Estimation of Probable Duration of Pregnancy, Approximate Equivalents of Temperature, Weight, Capacity, Measure, etc. Maximum Adult Doses by the Mouth, in Apothecaries' and Decimal Measures. Drops in a Fluid Drachm. Solutions for Subcutaneous Injection. Solutions in Water for Atomization and Inhalation. Miscellaneous Facts. Emergencies. Artificial Respiration. Signs of Death. Hints on the Writing of Wills. Table of Signs. Visiting List and Special Memoranda. Consultation Practice. Obstetric Engagaments. Record of Obstetrical Practice. Record of Vaccination. Register of Deaths. Nurses' Addresses. Addresses of Patients and Others. Cash Account. Price $2.00 net. William Wood & Co., New York.

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## STUDIES OF THE ETIOLOGY OF THE COMMON COLD

In their studies of the etiology of the common cold, Gerald S. Shibley, Katherine C. Mills and A. R. Dochez, New York (*Journal A.M.A.*, Nov. 22, 1930), first directed their efforts toward displacing the common potential pathogens of the upper respiratory tract, such as pneumococci, streptococci, Pfeiffer's bacillus, staphylococci, the gram-negative cocci and the gram-negative filter-passing bacteria, from the position of primary importance. Following these observations an effort was made to test the hypothesis that colds are caused by a filterable virus, one of those mysterious agents the exact nature of whose biologic activity still remains obscure. They decided to use animals for the experiment, and in searching about for a suitable animal they discovered that anthropoid apes are supposed to catch colds. They found that chimpanzees are susceptible to the human type of upper respiratory infection; that the clinical manifestations noted when these animals catch colds closely resemble those seen in man under similar conditions, and that the bacterial flora of the nose and throat of chimpanzees is practically identical with that of man. Individuals suffering from suitable types of colds were sought out. In all, twenty-eight inoculations of chimpanzees have been made with filtered nasal washings from human beings. Of these, twenty were obtained from patients in the acute stage of the common cold and eight from normal individuals at a season of the year when colds were at their lowest incidence. Of the twenty experiments with filtrates from colds, four have been excluded since the inoculations were made in animals recently purchased and which had recently suffered from respiratory infection. Of the remaining sixteen animals, seven contracted experimental colds, an incidence of 44 per cent of successful transmissions. The symptomatology of the experimental cold resembled exactly that of the spontaneous cold previously described. The usual incubation period was from thirty-six to forty-eight hours. The onset was characterized by lassitude, loss of appetite and the presence of a mucous nasal discharge. This was quickly followed by nasal obstruction, sneezing, coughing, and sometimes by inflammation of the pharyngeal mucosa. The mucous discharge eventually became mucopurulent and symptoms at times lasted as long as three weeks. Filtered nasal washings from human beings suffering from colds and from normal individuals have contained gram-negative filter-passing anaerobes in nearly the same proportion of instances. No evidence, however, has been obtained that these organisms have any etiologic significance in the initiation of a cold. The experimental transmission of the common cold from man to man was next attempted. For this purpose human volunteers, preferably young adults, were secured. All physically unsuitable individuals and all who harbored possibly dangerous pathogens in their upper respiratory tracts were excluded from this type of experiment. At the termination of the period of observation and study the selected volunteer was inoculated intranasally with filtered nasal washings obtained from individuals suffering from the early stages of the common cold. In a number of instances plain sterile broth was injected intranasally to exclude and control any symptoms that might arise from the irritating effect of the broth itself. Irritation arising from this source was found to be negligible. Nine experiments of this type have been completed and in four instances colds have been successfully transmitted, a 44 per cent incidence of positive experiments, which is the same as that obtained in the study with anthropoid apes. Filter-passing anaerobes were present in all the filtered nasal washings used in the studies of human transmission, both the positive and the negative results. The varieties of anaerobes present were the same in the two instances. These organisms are not believed to posses primary etiologic significance. The authors conclude that the contagious cold in human beings is caused by an invisible uncultivable, filtrable agent which in all likelihood belongs to the group of so-called submicroscopic viruses.

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## PHYSICAL REASONABLENESS OF LIFE

A. V. Hill, London, England (*Journal A. M. A.*, Nov. 8, 1930), insists that life is physically reasonable, in the sense that its detailed characteristics can best be studied by exact and quantitative experimental methods. The education of a medical man should lead him to the instinctive and confident view that magic has no place in medicine, that it is professionally dishonorable to believe, or to suggest, explanations of phenomena or methods of treatment which are physically unreasonable. To give physics, and physical methods competently and critically used, a high place in the medical curriculum is to set men's faces definitely in the right direction, and against the spread of magic and fraud. This is no small task—the discipline necessary for an adequate and critical use of physical methods and ideas cannot properly be given in the crowded years of a medical course. It is necessary that a certain number of properly trained physicists should be attracted to biology and induced to turn their attention to its problems. Hill continues: A training in physics and biology, an acquaintance with the facts of medicine and neurology, will prevent an unreasoning belief in spooks and spiritualism and miracles: a most depressing conclusion, for it is romance and magic and miracles which really move men's hearts, however hard they apparently be! The world is not less beautiful if bits of it become intelligible; a tract of country is not less romantic if we carry a map; the sky is not less blue if we know the blueness is due to the scattering of light by particles or molecules far up; there is no less pleasure in achievement if we use good tools than if we use bad ones. In scientific research we work and work, sometimes for months and years, in digging a tunnel with no apparent results; then suddenly comes the supreme joy of life—daylight begins to glimmer at the end, and in a few minutes we see that nature, after all, has not played us false. To one who works honestly and accurately, these moments are sure to come. And in using physical methods the joy is so much the greater because the achievement is more sure. Not only do we find the promised land, but often its details agree with surprising accuracy with the quantitative forecasts that have been made about it. It is no use, therefore, to tell a scientist that romance is dead, or a physiologist that physiologic problems are insoluble; the emotions he has experienced in finding new worlds will effectively prevent him from believing you.

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[1] *J. Biol. Chem., 76:2.* [2] *Ibid., 66:451.* [3] *Ibid., 80:15.* [4] *Ibid., 76:251.*

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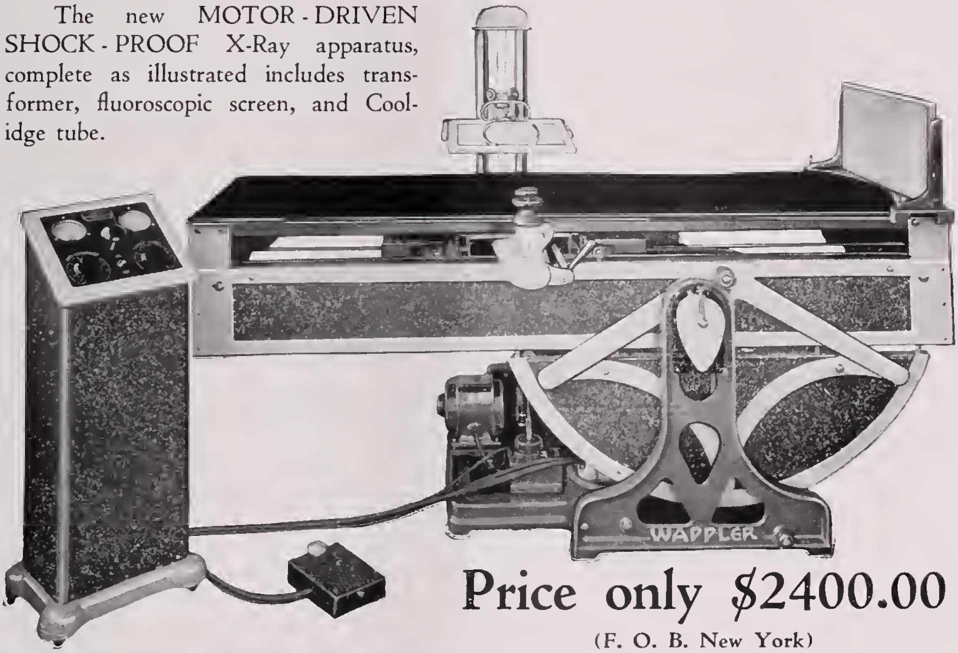

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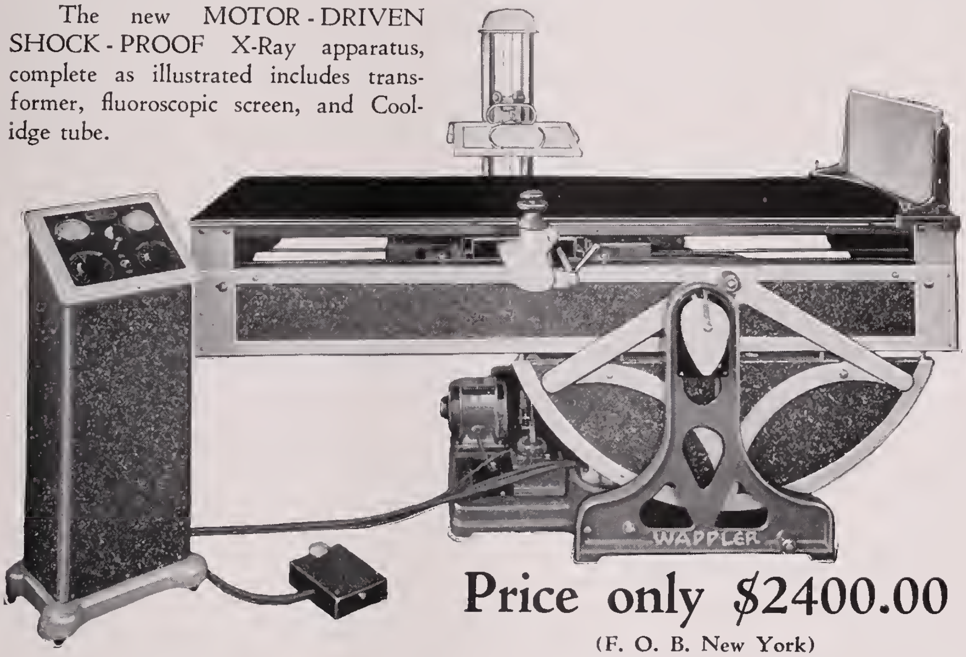

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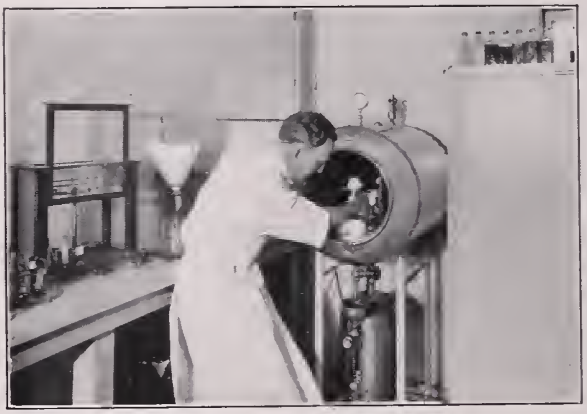

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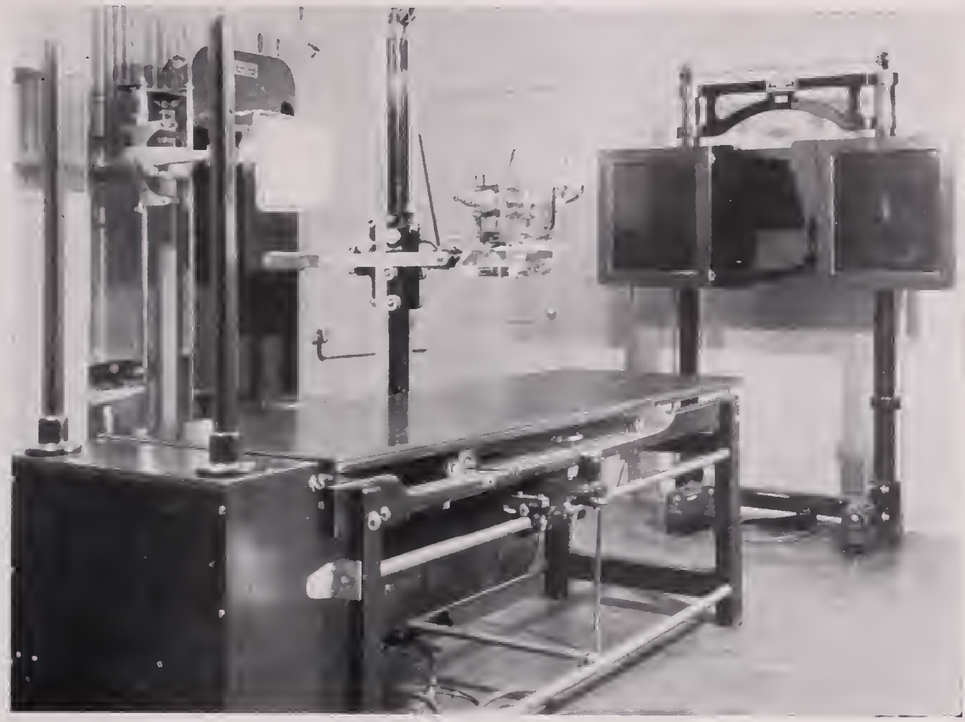

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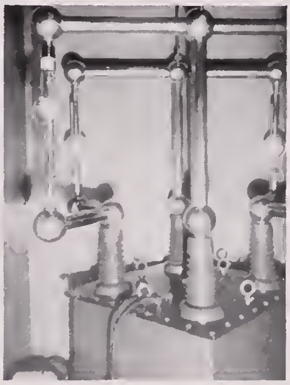

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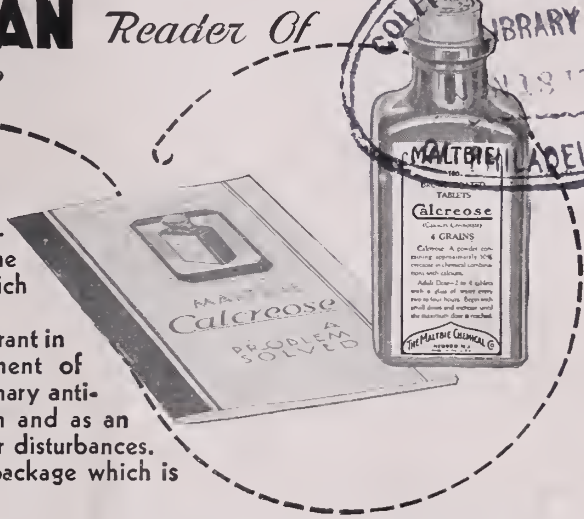

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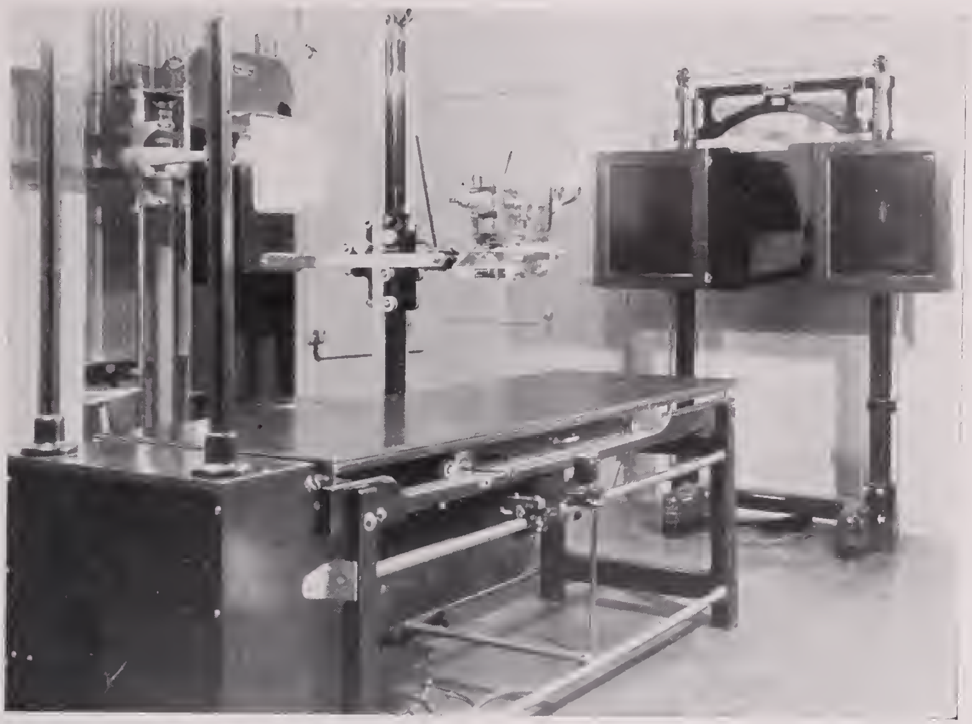

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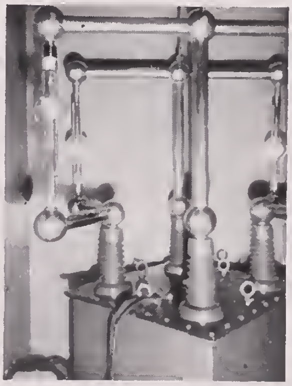

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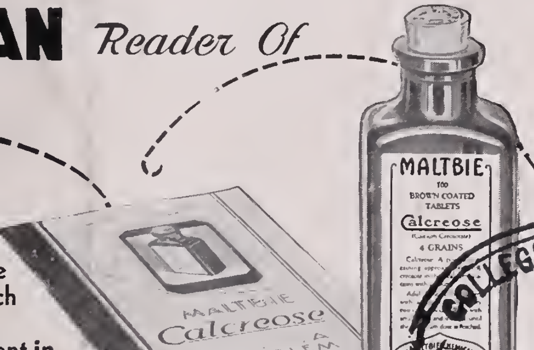

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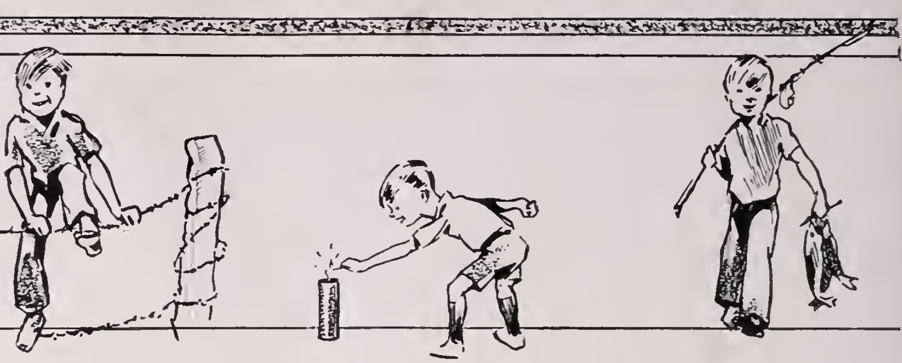

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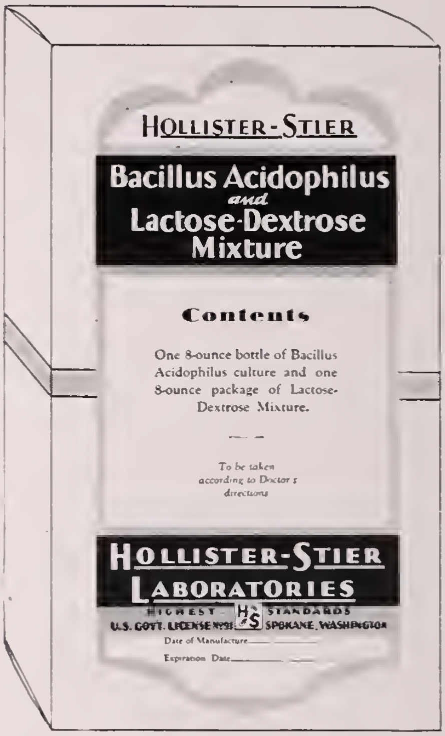
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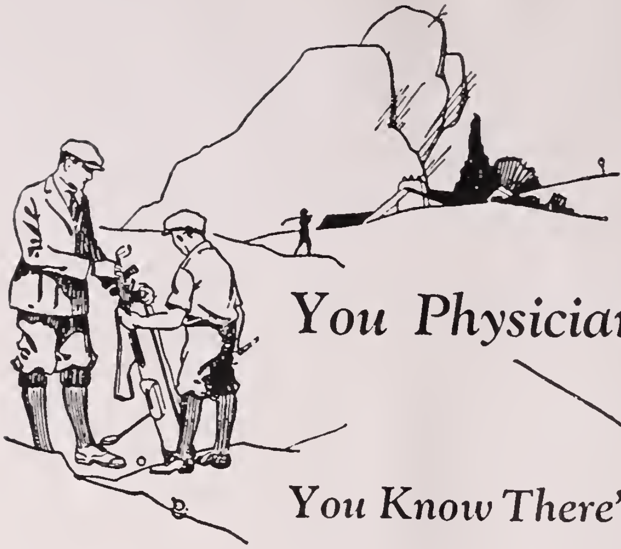

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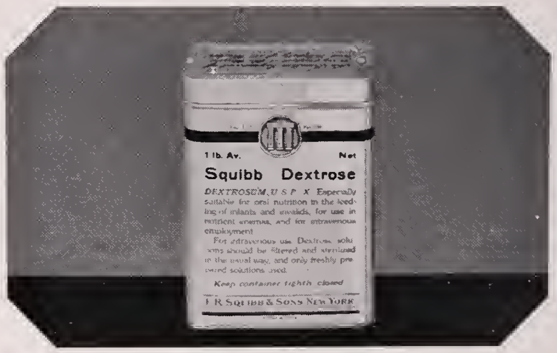

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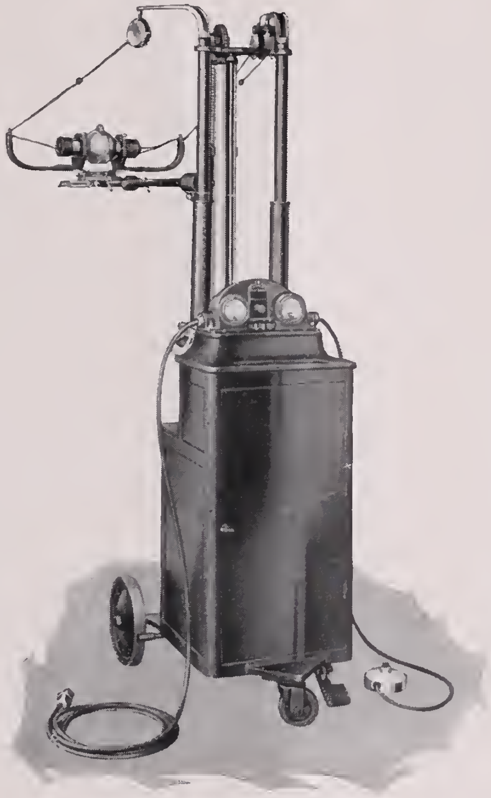

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